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ABSTRACT

Specific objectives of this two-phase study included: (1) assessment of design of the behavioral objectives in all secondary level courses; (2) construction of criteria for evaluation of the design; (3) testing of objectives against the evaluative criteria and/or the specifications of the curriculum design; and (4) determination of the validity of course prerequisites. Participants were administrators, consultants, and teachers who attended workshops in which they reviewed the behavioral objectives for their areas of specialization and revised or created new objectives to fit cognitive hierarchy, and related student-centered materials to the objectives. Participant contributions to the research were evaluated in measurable terms which were tabulated for assessment against the design. Study results established, for all courses, a curriculum model of behavioral objectives, critiqued by subject-matter specialists and behavioral scientists, and field-tested in the classroom. The study indicates that children who follow a specific cognitive sequence can demonstrate required knowledge or skills more efficiently than students who follow a random sequence. (Author/CJ)

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FINAL REPORT

Project No. 080653

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A Study To Design, Develop, Implement, Evaluate, and Revise Specific, Measurable Performance Objectives To Serve as a Model To Individualize Instruction for Secondary Schools

EDUCATIONAL SYSTEM FOR THE SEVENTIES
ES '70
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Bloomfield Hills School District
Bloomfield Hills, Michigan

July 15, 1970

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Bureau of Research

TABLE OF CONTENTS

Page
LIST OF APPENDICES iii

LIST OF ILLUSTRATIONS iv

LIST OF TABLES vi

COMPREHENSIVE SUMMARY OF RESEARCH STUDY 3

INPUTS FOR PROJECT 3
General Objectives
Specific Objectives
PROCESSES 4
Phase I
Phase II
OUTPUTS FOR PROJECT 5

INTRODUCTION 7

NEED 7
BACKGROUND FOR THE STUDY 10
Setting
Local Effort

LITERATURE ASSOCIATED WITH THE STUDY AND RELATED RESEARCH 12
Literature
Research Studies

METHODS 17

MASTER PLAN 17
Procedures
Contributions
Activities
Rationale
Use to be made of findings
Personnel
Disposition

PROCEDURES FOR PHASE I 30
The Four-Month Study
Source of Program Data
Major Research activities

Page

Results to be used for data collection
Sample of procedures undertaken for a discipline during Week I

PROCEDURES FOR PHASE II 41
Spring Workshop
Tasks of the Research Study Groups
Source of Program Data
Major Activities for the Spring Workshop

Summer Workshop
Source of Program Data
Tentative Plans for Conducting Workshop
General Information

PREPARATION OF FORMS 62

PERSONNEL 113
Responsibilities for Program Appointments
Project Director
Study Groups
The Consultants
The System Coordinators
Clerical personnel

CONCLUSIONS, DATA EVALUATION, AND RECOMMENDATIONS 127

CONCLUSIONS 127
Results of the study
Data for curriculum model
Sample objectives

DATA EVALUATION 156
QUALITY-CONTROL CHECKS 156
TREATMENTS OF BEHAVIORAL OBJECTIVES 157
STATISTICAL ANALYSES 157
IN-SERVICE TRAINING MATERIALS 167
OBJECTIVE CRITIQUES BY CONSULTANTS 167
PARTICIPANT SURVEY FOR STUDY 187

RECOMMENDATIONS 189

Page

FINDINGS REFLECTED IN THE ANALYSES OF DATA BY THE CONSULTANTS 189
Tentative Work Session
Group Meetings by Subject Area with Bloomfield Hills Personnel
Total Group Question-and-Answer Sessions
SUBJECTIVE CRITIQUES AND RECOMMENDATIONS BY CONSULTANTS 191
OBJECTIVE RECOMMENDATIONS BY CONSULTANTS 191

SUMMARY OF RESEARCH EXPERIMENT 292

ACHIEVEMENT OF THE RESEARCH OBJECTIVES 292

RELATIONSHIPS OF STUDY TO CURRICULUM INNOVATION, REVISION AND/OR CHANGE 295

RELATIONSHIPS OF STUDY TO EFFICIENCY AND EFFECTIVENESS OF A CURRICULUM FOR INDIVIDUALIZING INSTRUCTION 296

IMPLICATIONS OF THE RESULTS OF THE STUDY ON EDUCATION 297

RECOMMENDATIONS FOR FURTHER RESEARCH 298

APPENDIX 299

A. Basic Assumptions Concerning Curriculum Change
B. Method for Task Analysis
C. Quality-Control Check - 1967-68
D. Quality-Control Check - 1969
E. Glossary of Terms
F. Figure C - IMS Information Flow

BIBLIOGRAPHY 334

LIST OF ILLUSTRATIONS

Figure Page

1. Bloomfield Hills Schools Curriculum Research Task Analysis 23
2. Quality Control Check - Continuous Progress Schools 1968-1969 31
3. Elementary Quality Control Check 33
4. Secondary Quality Control Check 34
5. Objective Evaluation Sheet 37
6. Task Analysis 42
7. Spring Workshop Meeting Schedule 50
8. Summer Curriculum Workshop: General Information 63
9. Summer Curriculum Workshop: Personnel Data Sheet 64
10. Education Seminar 65
11. Summer Workshop Application (April 24) 67
12. Summer Workshop Application (May 23) 68
13. Discussion Group Schedule 69
14. Weekly Schedule 70
15. Curriculum Workshop Responsibilities -- Secondary 71
16. Summer Curriculum Workshop: Tentative Work Plan 73
17. Criteria for Objectives 74
18. Objective Evaluation Sheet 75

Figure Page

19. Special Equipment/Textbook Materials/ Supplies 76

20. Daily Progress Record 77

21. Bloomfield Hills School District Daily Progress Record 78

22. Course Summary Sheet 79

23. Course Evaluation Sheet 80

24. Evaluation -- Student Performance 81

25. Student Profile 83

26. Consultant Inventory 85

27. Agreement for Providing Consultant Services 87

28. Statements and Implications 89

29. Force-Field Analysis 104

30. Task Analysis 105

31. Instructional Guide 109

32. Summer Curriculum Workshop -- Pay Report 111

33. Hourly Employees Pay Report -- 1967-1968 112

34. System Design for a Student-Centered Curriculum 129

LIST OF TABLES

Table Page

1. Minimum Qualifications Acceptable for Research Personnel 115

2. Directory of Personnel for Staff Utilization and Clerical Services 117

3. Conceptual Model of Behavioral Objectives 132

4. Secondary Teacher Responses to Quality Control Check 156

5. Composite Report of Behavioral Objectives Changes 158

6. Areas of Study Categorized by type of behavioral objective or materials 160

7. Course Objective Evaluation Chart 162

8. Course Objectives for the Cognitive Processes 163

9. Classification of Course Objectives by Discipline Objectives 165

10. Comparisons of Twelfth-Grade Students at Andover and Lahser High Schools Who Were Tested in October 1966 at Andover Based on Data Obtained from the Scores of Iowa Tests of Educational Development Form X-4 168

11. Comparisons of Ninth-Grade Students at Bloomfield Hills Junior High and West Hills Junior High with Students at East Hills Junior High Who Were Tested in October 1966 at East Hills or Bloomfield Hills Junior High, Based on Data Obtained from the Scores of Iowa Tests of Basic Skills 170

12. Implications and Instructional Tasks Drawn from Educational Statements 172

13. Participant Responses to Rating Questionnaire 187

14. Preliminary Findings of Consultants 192

Table Page

15. Terminal Findings of Consultants 198

16. Objective Critiques of Course/Subject Areas by Consultants Phase II (Subject-Matter Specialists) 215

17. Objective Critiques of Course/Subject Areas by Consultants Phase II (Behaviorists) 218

18. Consultant Recommendations by Course/Subject Area and Objective Phase II (Subject-Matter Specialists) 220

19. Consultant Recommendations for Revisions by Course/Subject Area and Objective Phase II (Behaviorists) 245

COMPREHENSIVE SUMMARY OF RESEARCH STUDY

INPUTS FOR PROJECT

The Public School District of Bloomfield Hills, Michigan, had initiated a K-12 curriculum for individualizing instruction based on a systems approach for measuring achievement as required by criteria included in the specifications of performance objectives. From June, 1968, through October, 1969, a research study to design, implement, evaluate, and revise these behavioral objectives was undertaken by the local district in cooperation with the Bureau of Research of the U.S. Office of Education which funded the project.

This study was planned to fill an educational gap, to establish specifications for achievement, to give supportive evidence for learning, and to contribute to the design of a systems approach. Objectives established to bring this study into an operable perspective are as follows:

General Objectives

1. To establish in all courses at the secondary level a curriculum model of behavioral objectives, which are approved by various experts, tested against relevant criteria, and tried out in actual classroom situations

2. To disseminate information within the ES '70 Network and at the national level through the services of the E.F. Shelley Company and the Office of Education

3. To make this study meaningful to the State Department of Education for stimulating greater communication between Michigan's other local school districts and Bloomfield Hills

4. To bring to the local community the model of the set of behavioral objectives for offering articulation horizontally and for ordering sequential patterns vertically

Specific Objectives

1. To assess the design of the present behavioral objectives in all courses at the secondary level

2. To obtain data from other agencies which have been involved in the construction of behavioral objectives and/or other related concerns including research undertakings

3. To construct criteria for the evaluation of the design

4. To test the objectives against the evaluative criteria and/or the specifications of the curriculum design

5. To cross-index the behavioral objectives without regard to discipline whenever expedient as indicated by the test analysis

6. To inventory published resource materials which come to the attention of the researchers in effecting the test analysis of Objective 4

7. To determine the validity and reliability of course prerequisites

Accomplishments were to include criterion methods of assessment against the design of behavioral objectives à la Mager. The following provided analysis criteria for six areas of behavioral specifications:

1. Structure,
2. Clarity,
3. "Best fit,"
4. Order and/or rank,
5. Sequence,
6. Essential skill substance.

The program was divided into two phases: Phase One, a four-month study, and Phase Two, an eight-month study. Phase One (Summer 1968) was planned to examine the behavioral objectives in light of the specifications of the evaluative criteria and the specifications of the curriculum design. Cross-referencing of objectives and inventorying resource materials were undertaken as they were relevant to the primary purpose, that of revising the behavioral objectives of the experimental curriculum. Phase Two continued the program with greatest emphasis placed on a newer aspect of the curriculum design, namely, course objectives. They were field tested, gaps identified and closed, and then field-tested again for further acceptability. Off-the-shelf materials, as well as teacher-prepared materials, were encoded with reference to their instructional value for attaining objectives.

PROCESSES

Phase I

There was a workshop for a group of administrators, consultants, and teachers during the summer of 1968. Following orientation conferences the participants reviewed the behavioral objectives for their areas of specialization, and revised or created new objectives as indicated by the examination. The research staff classified materials, methods, and media to determine to what extent the behavioral objectives would be realistic to serve as the basis for instruction. Study groups were supervised by Marilynn Wendt, Project Director, and Dr. Robert E. Boston, Assistant Superintendent for Instruction.

Phase II

Two work shops provided the vehicle for continuing with this phase of the project. For the Spring Workshop (1969) teachers were released from their classroom responsibilities on the study-group meeting days. Supervisors, consultants, and teachers met in small subject-area subgroups. Their tasks were to:

1. Review original design,

2. Plan course of action,

3. Revise all objectives to fit cognitive hierarchy,

4. Relate student-centered materials to objectives, and

5. Revise objectives.

The Summer Workshop was much more expansive than the Spring Workshop.

The Summer Workshop (1969) was conducted at Lahser Senior High School by Miss Wendt and Dr. Boston. The participants included administrators, 11 consultants, and a minimum of 60 teachers. Two days of training sessions presented the leaders a description of their responsibilities and a prototype of a task analysis to be used in conjunction with the technical terminology of the research program. Participants evaluated their contributions to the research in measurable terms based on uniform criteria. Their results were then tabulated in light of the criteria described for assessment against the design. Other data gathered related time, achievement, and maturity (level of instruction) to the attainment of behavioral objectives.

These data were used in finalizing the second phase of the project. The behavioral objectives with their recommended learning strategies were field-tested again with the opening of schools in the fall of 1969. These data were also used by the consultants in evaluating the extent to which the experimental function had been carried out for meeting the requirements of the research objectives.

OUTPUTS FOR PROJECT

The results of this study established in all courses a curriculum model of behavioral objectives. They were critiqued by subject-matter specialists and behavioral scientists, tested against relevant criteria, and field-tested in actual classroom situations. These results have been and will continue to be disseminated to the constituent members of the stated educational communities.

For the curriculum model the stated behavioral objectives for secondary courses were ordered according to the type of objective and followed the numbering system for coding objectives to the Discipline Objectives and the System Objectives.

Data were evaluated by means of quality-control checks, treatments of behavioral objectives, statistical analyses, feedback from in-service training and consultant recommendations.

It can be implied from the results that (1) local staff members have the potential for defining quality behavioral objectives, (2) it is possible to arrange a sequence of objectives allowing students to progress as rapidly as they are able without locking teachers and/or students into a rigid system, and many students are able to function with a minimal amount of teacher direction and to assume much responsibility for their own learning.

Finally, the study indicated that children who followed a specific cognitive sequence could demonstrate required knowledge or skills more efficiently than students following a random sequence.

INTRODUCTION

NEED

Paralleling management systems designed for business and industry, educators have been turning their attention to the study of a systems approach for education. One such person is William G. Savord, Assistant Superintendent, Office of Research for the State of Hawaii. He states, "The Program Objectives are more specific than the goal. Usually there will be more than one objective. They should be stated in group behavioral terms and must be specifiable. If possible they should be quantifiable. ... Finally, A General Plan for Evaluation should be described. This plan must relate directly to the Goal and Objectives and provide us with the information which will allow us to determine to what extent the goal has been achieved.[1] These performance objectives then serve as the criteria to measure success for comparing achievement output with the instructional input.

Robert M. Morgan and Jack C. Morgan describe the importance of behavioral objectives in applying a systems analysis for educational change:

> The activity having the most pressing priority relates to the setting of the educational goals and operationally defining the performance objectives. The performance objectives define the output specifications for the system and must precede the design of the system. The ES '70 schools (U.S. Office of Education's Bureau of Research has joined with approximately seventeen local high school districts located in fourteen states in designing and developing a new educational program at the high school level.) have already agreed upon their broad aims. ... For (these goals to become purposeful in a design of a new system) they must be operatively defined in terms of behavior outcomes. Without performance objectives there is no basis for deciding which learning intervention or teaching strategy would be most effective. ...
>
> There are other important reasons for specifying the outcomes of educational systems. It is necessary for longitudinal validation of the effectiveness of public education. ... Another reason for needing behavioral objectives relates to cost effectiveness of educational programs.

---

[1] William G. Savard, The Hierarchy of Curriculum and Instruction System Documentation, Honolulu, State of Hawaii Department of Education, 1967, p. 6.

> Once these objectives are set, and agreed upon, all the other variables in the educational program need to be arranged in such a way as to optimize student attainment of the objectives.[1]

If instruction is considered from this point of view, instruction which focusses on the knowledge of content is no longer relevant to a program which builds logically upon the acquisition of skills. Disciplines, of themselves, are no longer independent; it is more desirable to fit their subject-matter into the instructional patterns as needed.

Robert F. Mager, Research Adviser and Director for Aerospace, speaks positively to substantiate the urgency for educational change:

> There is no question but that a radical overhaul of the high school curriculum is long overdue. The current curriculum is out of date, out of touch, and out of balance. ... The need for curriculum revision is obvious, urgent, and well documented. ...
>
> In short it is felt that previous attempts to update the high school curriculum have had minimum impact because objectives were not specified.... Thus, for a curriculum to be efficient it must achieve the goals leading to maximum facilitation of ultimately desired behavior. Both effectiveness and efficiency pivot around the comprehensiveness and the clarity with which the curriculum objectives are stated. ...
>
> The first step in systematic curriculum design, therefore, is the development of a comprehensive catalog of performance specifications, ... They would be defined in terms of the observable behavior that would be accepted in evidence that the objective has been achieved.[2]

If behavioral objectives add the dimension of measurement to instruction, this "yardstick" of achievement will conform to a standard format, a common framework for reference. The following information is recommended:

1. Initial efforts should be directed toward development of terminal performance specifications.

2. Several sources should be investigated in the derivation of the performance specification.

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[1] Robert M. Morgan and Jack C. Morgan, "Systems Analysis for Educational Change," Trend, Spring 1968, p. 29.

[2] Robert F. Mager, Deriving Objectives for the High School Curriculum, Unpublished monograph, February 14, 1967, pp. 1-9.

3. Go directly to the vocation or profession for information from which realistic secondary curriculum objectives may be derived.

4. A secondary objective of the analysis would be to identify the kind of skills related to adequate or maximum success.

5. A pilot study should be carried out to help provide useful information.

6. The resulting catalogue of performance specifications should be published.

Hopefully, American education will become mindful of the need for innovative educational programs which can be assessed by means of student achievement based on a common unit of measure, the attainment of the performance objective. One such district has recently become deeply committed to a curriculum for personalizing instruction:

> With the influx of federal funds and increased local and state aid, the Anniston (Alabama) schools began the process of personalizing the curriculum in the fall of 1965. ... Even an after-school program for former dropouts and other adults was developed on a personalized basis. Set up with funds from the U.S. Office of Economic Opportunity the program allows each adult student to begin any course on the level that his test scores indicate he has reached.
>
> The first major step toward personalized instruction was an extensive curriculum planning project financed under Title III of the Elementary and Secondary Education Act in the summer of 1965. ... In the guide given each student, the teacher clearly states the specific objectives that the student is expected to accomplish by the time he completes a particular unit of study. ...
>
> Anniston has received $120,000.00 for Project PLATO, the evaluation phase of the curriculum planning project.
>
> Use of a computer will enable the school to combine all available data on a student and come up with an individualized program of activities. As the student progresses through the different levels of the curriculum, he will be retested and the results will again be fed into the computer. The computer will print an immediate achievement profile which can be given to the teacher, the counselor, and the student.[1]

---

[1] J. Revis Hall, Katherine Killebrew, and Nellie MacLewis, "Our School System Has Become Deeply Committed to Personalizing Instruction," NEA Journal, November, 1966, pp. 36-37.

BACKGROUND FOR THE STUDY

Setting:--Bloomfield Hills, Michigan, is a city containing almost twenty-eight square miles and ten miles northwest of Detroit. It is a rapidly growing suburban community of about 26,500 with a school enrollment of over 9,000 boys and girls. Of the 5,500 families residing in the district, sixty-seven percent have children under nineteen. For taxing purposes, the single family home values comprise about eighty percent of the total real value of the district. The funds allow the community through its Board of Education to operate a K-12 education system. The 6-3-3 plan, adopted in 1955, is the result of a study at Michigan State University. Within this framework there are two senior high schools, two junior high schools and eleven elementary schools.

Bloomfield Hills has the distinguishing characteristics of an educational community. Its members are, first of all, committed to two basic goals for the school system: (1) to encourage each student to develop to the fullest his capacity to learn and (2) to excel in scholarship. The climate of the entire community is oriented toward educational excellence; there are many professional persons, such as doctors, lawyers, business executives, researchers and Michigan's former governor who lives in Bloomfield Hills. In fact, the ratio of residents with PhD's to the total population is much higher here than in other nearby communities. The setting is ideal for communication with colleges and universities in the area. Along with the campuses of Oakland Community College and two private liberal arts colleges, Saint Mary and Cranbrook,Oakland University, a major university for honor students is less than five miles from the district. Bloomfield Hills is also fortunate to have four other large universities within a radius of thirty miles from the city: Wayne State University, University of Detroit, University of Michigan and Eastern Michigan University. The researcher is attracted to Bloomfield Hills because it is one of the finest centers for technological services in the United States. Data processing services, including shared computer time, are more than adequate to handle the most complex problems. Technicians, programmers and systems analysts are available through the universities, private data processing firms and the offices of the Oakland County Intermediate School District. Mention should be made in this regard that many top executives for large industrial and business concerns live in Bloomfield Hills. Their know-how, position and influence add an extra dimension to the field of research possibilities here.

Local effort:--In order to furnish a setting for excellence in scholarship and individualized instruction, the Board of Education supported, at the outset, a plan for reorganizing the entire K-12 curriculum. To date, it has been installed in Lahser High School, East Hills Junior High School and Way, Fox Hills and Lone Pine Elementary Schools. Board of Education members have attempted to broaden the educational opportunities of all students by offering a more flexible program and by their willingness to support curriculum experimentation. The Board has based its decisions on the following philosophy of education:

> The Bloomfield Hills Schools function as an integral part of the

> education system of the community to serve boys and girls better physically, socially, psychologically, emotionally and educationally.
>
> We believe that boys and girls differ greatly in their innate abilities and in their perception, approach, response and readiness for a given task or situation. To allow for this wide range of individual differences, a curricular pattern is organized that allows for continuous individual progress based on the child's readiness to achieve.

This inclination on the part of the Board to cooperate in evaluating and revising the curriculum was brought to the attention of the general staff by Robert Boston, Assistant Superintendent for Curriculum, and Marilynn Wendt, Director of Curriculum, on August 1, 1966. During the month of September, a brochure, a combination brochure and worksheet for constructing behavioral objectives, and transparencies were prepared to explain the innovative continuous progress curriculum. In October, the staff participated in thirty-five workshops which offered training in the construction of pre- and post-tests and progress charts. As a follow-up of these workshops, the group characterized the functions of a continuous progress classroom. Similar workshops in November simulated a continuous progress situation given the setting, the pretest results and a blank progress report. The participants were asked to place students, give directions to students, indicate the involvement of members of the class and evaluate their progress. The workshops in December completed the plans for study and practice for constructing behavioral objectives.

Paralleling these activities during the 1966-67 school year, the Board of Education encouraged the creation of and underwrote a curriculum study group made up first of twenty and later expanded to forty teachers and administrators -- persons interested in curriculum development with a systems approach. These participants met regularly six hours per week and also devoted many hours of their own time to construct performance objectives, to select the content vehicle and method/media trade-off, and pre- and post- evaluation devices.

In addition to the members of the local study groups, outside consultants were brought in to work with the study group, act as a consultant and offer advice for defining educational objectives. Edward Bantel, Professor of Psychology, acted as liaison between Bloomfield Hills and Oakland University. He was responsible for coordinating learning theory with instructional practices. Lee Brown, President, represented the Learning Systems Division of Xerox. He suggested the use of James Popham's filmstrip - tape series on constructing behavioral objectives.

Other specialists who were not able to come to Bloomfield Hills, participated through correspondence. Among these persons were David Krathwahl, Benjamin Bloom, Robert Mager and Bertram Masia. The System Objectives were sent to Henry Walbesser for critiquing and evaluation. Later Bruce Tuckman, Rutgers University, revised the System Objectives.

Committees from the study group visited other projects to study and compare results and accomplishments in relation to the curriculum plans at Bloomfield Hills. Only forward-looking programs were investigated, those which were expected to have an impact upon reform in education in the very near future. They visited the Oak Leaf Project at the University of Pittsburgh. Donald Deep was principal of the elementary school at the time and described for the guests the I.P.I Program, Instruction by Individualized Prescription. During the visit they had the opportunity to observe I.P.I in action at the Research and Development Center.- Another representative spent time with John Downs, Principal at the Franklin and Nettleton Elementary Schools in Duluth, Minnesota. There they were introduced to Thorwald Esbensen's tape-slide series. Yet another group with subject-matter interests were sent to Norridge to become acquainted with the humanities and English program. The last group visited the Nova schools to learn more about the program for individualizing instruction.

LITERATURE ASSOCIATED WITH THE STUDY AND RELATED RESEARCH

Literature:--Education in the United States today can be summarized by the one word "change." This characteristic term has been of enough national concern to exert considerable pressure on educators and education agencies to improve, not only the product but also the design and processes of the education system.

The aspect of change as defined by the Bloomfield Hills continuous progress curriculum for this study will have little value unless the schools establish specifications of the ends toward which they are progressing. The January, 1967, Phi Delta Kappan describes this approach:

> Major change can be brought about only if many projects are organized together with the goal of developing new systems of education. The scattered bits of innovation have to be drawn together, organized by a philosophy, tested and revised by research and implemented by methods that lend themselves to reproduction. This is a task for which the research community in education and the educational community itself ... needs all the help it can get.

Emphasis on the importance of scientific methodology in contributing to evaluation in education is illustrated in an address presented by Sidney P. Marland, Jr., Institute for Educational Development, for a conference on testing problems:

> We do indeed have a need in education for assessing the

> effectiveness of teachers. The pupil test is a shabby and unworthy alternative to the assessment of teachers. But we have never faced up to systematic and objective teacher evaluation.[1]

To meet this need a curriculum is based on the added dimension of a systems approach. This is a method of looking at objectives, at alternatives, at imputs or that which goes into a program, at outputs or that which results as an end-product, at costs, at benefits, at sequence and timing to determine which routes seem best early in a project, before serious mistakes or big commitments are made. As Joseph H. McGivney, Syracuse University, has stated:

> To the extent that the new "systems" approaches stimulate decision makers (and their staff) to think through the programs and objectives in a systematic efficient way, they will have aided in the process of improving resource allocation decisions.[2]

It is to the strength and weakness, the adequacy and inadequacy and the completeness and incompleteness of the set of behavioral objectives to which the goals of this project are addressed. Flanagan makes this need clear in his article found in the September 1967 issue of the Phi Delta Kappan:

> In its application to education, objectives must be defined, input and output of the system have to be accurately measured, and all relevant conditions described and defined. The specific factors which have prevented effective use of these approaches in education are lack of well - defined objectives and inadequate measuring procedures to determine whether the student has achieved the objectives set for him.[3]

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[1] Sidney P. Marland, Jr., "A Customer Counsels the Testers," Invitational Conference on Testing Problems, (Educational Testing Service, 1969), pp. 107-108.

[2] Joseph H. McGivney, "The New 'Systems' Approaches to Resource Allocation Decisions; A Second Look," Educational Technology, Vol. IX, No. 12, (December, 1969), p.30.

[3] John C. Flanagan, "Functioning Education for the Seventies," Phi Delta Kappan, Vol. 49, (September, 1967), p.28.

Educational systems should be able to draw upon a source of well-defined behavioral objectives which will fill an educational gap, establish the specifications for measuring achievement, give supporting evidence for learning, and contribute to the design of a systems approach. School districts looking for a pattern to individualize instruction will be able to construct their objectives following the format of the model or to transmit the objectives directly into their respective school systems from this model.

The Advanced Systems Laboratory at New York Institute of Technology, Old Westbury, New York, has a federally funded project, Automated Instructional Management Systems,designed to evaluate students and groups, including curricular content, through the application of modern computer and management techniques. Ernest N. O'Dierno, Director, describes the course structure:

> By relating each question or group of questions in the course to particular course objectives, definitive conclusions based on student responses can be reached regarding overall performance in a subject area or skill, within the course, and question validity relative to desired objectives.[1]

The following are materials representative of current American thought related to the role of behavioral objectives for measuring cognitive skills in educational programs.

Bloom, Benjamin S.	*Taxonomy of Education Objectives, Handbook I: Cognitive Domain,* (New York: Longmans Green, 1956)
French, Will (ed.)	*Behavioral Goals of General Education in High School,* (New York: The Russell Sage Foundation, 1957)
Lindvall, C. M. (ed.)	*Defining Educational Objectives,* (Pittsburgh University of Pittsburgh Press, 1964)
Mager, Robert F.	*Preparing Instructional Objectives,* (Palo Alto, California: Fearon Publishers, 1962)
Sanders, Norris M.	*Classroom Questions: What Kinds?* (New York: Harper and Row, 1956)

---

[1] Ernest N. O'Dierno, *Automated Instructional Management System Aims Version 3 System Manual,* (Old Westbury, New York, New York, Institute of Technology), p. 12.

Research studies: -- Research studies, concerned with behavioral objectives per se or with their function in a curriculum, and related investigations are listed below:

An attempt to individualize instruction --

Brockton, Massachusetts

The Continuous - Progress Program which places emphasis on the objectives to be learned rather than on the course to be completed.

Bucknell University

Project MODELS to increase student learning in subjects with high cognitive content --

University of Wisconsin

Comprehensive School Mathematics Program to individualize instruction in mathematics --

Central Midwestern Regional Educational Laboratory

Program for Learning in Accordance with Needs, Project PLAN, a system of education which requires the formulation of educational objectives for procedures for using resources of the computer effectively --

Westinghouse Learning Corporation and American Institute for Research in the Behavioral Sciences

Educational technology study --

George Washington University

Educational System for the Seventies --

This is a massive project being undertaken by nineteen school districts throughout the Nation. It is a program which radically modifies the present educational system, a program responsive to the present - day needs of students and would permit the maximum self-actualization of each individual. This is a coordinated research effort sponsored by the Bureau of Research of the U.S. Office of Education to lend to the development of an "organic" curriculum. A first step would be the specifications of behavioral objectives:

The first step in building such a student-centered curriculum

> is to study those behavioral attainments needed by the individual for entry into a variety of past high school activities. Whenever possible, these requirements should be stated specifically and in measurable behavioral terms. Following the lead of the systems analyst, we should describe specifically and precisely as possible the learning experience which would lead to the desired behavioral outcomes.[1]

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[1] Robert M. Morgan and David S. Bushnell, Designing an Organic Curriculum, Unpublished monograph, p. 7.

METHODS

MASTER PLAN

The master plan to fulfill the purpose of this study and to achieve its objectives was submitted to the Bureau of Research, U. S. Office of Education, April 5, 1968. It was a proposal, entitled "A Study to Design, Develop, Implement, Evaluate, and Revise Specific, Measurable Performance Objectives To Serve as a Model to Individualize Instruction for Secondary Students."

Procedures:--The activities to carry out the objectives previously stated would require the part-time services of a selected group of school personnel during a one year period. These activities would fulfill the empirical studies to formulate the four macro-units of the research design:

1. Assessment and critique of the behavioral objectives in the present design.
2. Analysis of the effectiveness of the behavioral objectives within the framework of continuous progress and of the rigor by which they would adhere to the accepted model for eliciting data.
3. Revision of the behavioral objectives based on the advice of outside consultants, committed to the goals and purposes of the organic curriculum, the recommendations of other interested agencies, comparisons with the distinguishing tenets of the research model, and the results drawn from classroom implementation of the curriculum design.
4. Re-evaluation of the revised behavioral objectives as they are infused again into the curriculum and furnish the specifications for measuring student achievement.

Contributions:--Provisions would be made for the contributions resulting from this--study to be given to regional laboratories, state departments of education, and other appropriate institutions. The findings of this research study would feed back to innovative school districts in many ways, among which are the following:

1. A curriculum manual would be prepared to assist administrators and/or members of the teaching staffs in introducing behavioral objectives to individualize instruction.
2. The patterns of the revised objectives in Bloomfield Hills would serve as a model of curriculum restructuring.

3. The behavioral objectives created for Bloomfield Hills would be effective for instruction in the inner-city or rural school if the content of the instructional materials is appropriate to the cultural patterns of the student population.

Activities: -- The Project Director would organize an in-service program to function from June 1, 1968 through May 31, 1969. This program would operate through two study groups which would function for the equivalent of eight hours each week to accomplish the overall objectives. The larger of the two groups would be made up of approximately 60 staff members visiting consultants and 11 system coordinators. They would have the responsibility for gathering, examining, and furnishing data as well as executing the administrative directives for reaching the indicated goals.

In addition, a very carefully selected smaller group chosen from among the members of the larger group would plan the program, delegate the various tasks, act as liaison among the various persons involved in the project, and provide feed back for evaluating the research.

These in-service study groups would meet on Saturdays and other convenient times during the week for workshops, not to exceed eight hours of salaried time. Although the work sessions might naturally fall into conferences for subject area subgroups or total involvement, either kind would meet for its sessions in one of the continuous-progress schools.

Leadership duties would be shared by certain Bloomfield Hills administrators under the jurisdiction of Robert E. Boston, Assistant Superintendent for Curriculum and Local Coordinator for the ES '70 Project of the U.S.O.E. The Project Director would handle the administrative duties, coordinate the project, and advise Dr. Boston on the progress, successes, failures, and needs as the program develops. The Project Coordinator would prepare and expedite all federal reports, control expenditures in keeping with the provisions of the budget, and construct task analysis for coordinating activities and for identifying task completion among the various groups or individuals responsible.

Visiting consultants and the System Coordinators would assume specific obligations in order to assure the administration that the project will move forward to achieve pre-conceived interim objectives within a given time limit and thus complete the study at the end of a year.

The consultants would visit Bloomfield Hills a minimum of four times or the equivalent of four days for rendering consulting services. During the first visit they would give directions including the construction of a design to which the individual teachers would subscribe and categories indicating the specifics for what has to be done and for the time units which apply. During the second visit they would study the progress shown to date. From these generalities the specialists will make pertinent recommendations to establish the next series of task blocks which will identify the particularities of the individual assignments. Collectively the experts would be stating specifically the definite procedures to be undertaken and completed during the second time segment. The third time around these men would be expected to evaluate the program to date and, personally, to pick up the lag in case any components along the critical path might endanger the success of the system because of any delays in one or more area of operation. The fourth visit would conclude the workshops for developing the curriculum model of behavioral objectives. At this time the consultants would write a final report stating their goals, describing the activities under their tutelage, identifying the success of their efforts, and making recommendations for further study in relation to the extent the goals were reached.

The System Coordinators, on the other hand, would make up "on-line" personnel. They would assume the responsibility for accomplishing the directives proposed by the Project Director. Their duties would include the following:

1. To give out specific tasks among members of the groups.
2. To coordinate the program activities in developing the program between the study groups and the administrative staff, outside agencies, and groups involved in cross-indexing.
3. To coordinate the tasks of inter- and intra-group personnel.
4. To show responsibility for the successful functioning of the study groups.
5. To act as resource persons for the study groups.
6. To know what is available for facilitating efficient procedures.
7. To contribute toward the plan for developing and writing the design of the study.

The equivalent of two persons working full-time would be essential to accommodate the production of materials and to handle necessary correspondence and clerical assignments. At least one of these persons should be a machine operator in order to duplicate material in quantity. It would be very helpful if the second person possess the additional clerical skills for performing secretarial duties.

The roster of participants working in the project would only be filled after careful screening and testing by the Project Director to determine the proficiencies of the applicants, as well as to learn their qualifications and personal interest in curriculum research.

The aim of the Task Analysis, beginning on page , is to discuss the activities through which the objectives of this proposal would be accomplished. The topics presented in Column 1 provide an overview of the various tasks to have been performed from June 1, 1968 through May 31, 1969; the general scope of the project and intra-task relationships are specified. The general time frame during which the various activities would be accomplished and specific programs generated are listed in Column 2 and Column 5. This is followed in Columns 3 and 4 by a consideration of the organizational concept under which the program will operate. They include to the left the persons who are responsible for the portion of the program indicated and to the right others who are participating.

Rationale: -- The following rationale behind the proposed approach indicates why it is felt that this approach would most effectively accomplish the project objectives:

1. The study would contribute to the refinement of a learner-centered instructional program based on measurable behavioral objectives;
2. The behavioral objectives will make use of the maximum number of existing materials;
3. The research study is conducted and evaluated in a real school environment;
4. The program provides for the documentation and dissemination of all significant project experiences and products;
5. A nucleus of teachers are well-trained in the innovative design, construction, and implementation of behavioral objectives for education;
6. The program provides for the complete revision cycle in preparing the objectives;
7. The program utilizes nationally accepted consultants who have the intellectuality and savoir faire for adequate coordination and review; and
8. The study provides for accurate documentation and program control.

Use to be made of findings: -- As often indicated, the real measure of the success of a program is the degree to which its products are disseminated and utilized. Provision will be made for all reports of this study to be distributed to regional laboratories, state departments of education, and appropriate institutions.

Staff personnel will be encouraged to prepare for participation in activities related to the research, such as the publication of articles in professional magazines, presentation of papers at professional association meetings, and descriptions of the study at in-service events. This feedback concept will be implemented by the staff members involved who will continuously judge the effectiveness and make recommendations for necessary revisions of the behavioral objectives.

1. Dispersion: A curriculum manual will be prepared for administrators and members of teaching staffs to use in implementing the continuous-progress design. There will be guidelines in the handbook to follow based on a systems approach for designing and constructing behavioral objectives.

2. Demonstration: Criteria for selecting behavioral objectives have centered around the desirability of producing a curriculum which provides the optimal education for boys and girls in all types of educational communities. The patterns of the revised objectives in Bloomfield Hills will serve as models not only for the ES '70 schools but for other schools as well.

Of recognized value here is the demonstration visit which will give a visiting team a clear picture of the function of behavioral objectives in the innovative operation. Such a visit will acquaint members of the team with the practices and outcomes accompanying the implementation of behavioral objectives in a continuous-progress curriculum.

3. Distribution: The behavioral objectives constructed for Bloomfield Hills should be installed in other school systems representative of a cross-section of the student population. Attainment of the behavioral objectives will measure cognitive skill irrespective of the content selected as the learning vehicle. The materials will be effective in the inner-city or rural school if the content of the materials chosen for the behavioral objectives is appropriate for the cultural patterns and life styles of the student population.

Personnel: -- None of the professional persons would serve within the scope of this project full-time although most of them will be a part of the Bloomfield Hills continuous-progress team. Their salaries would be comparable to and competitive with the salaries of others holding positions in the area which require similiar responsibilities, if such positions exist.

There are consultants who have indicated their willingness to become involved in or who have previously been engaged for research services pertaining to the Bloomfield Hills continuous-progress curriculum. A sampling of these experts, their positions and areas of specialization are listed below:

Dr. Edward Bantel, Oakland University, Learning Psychology

Dr. Walter Ambinder, Wayne State University, Learning Abilities Laboratory

Dr. Bruce Tuckman, Rutgers University, Behavioral objectives

Dr. Bertram Masia, Case Western Reserve, Research specialist

Dr. David Wells, Oakland Intermediate School District, Mathematics

Dr. Edward Welling, E. F. Shelley Co. (formerly), Educational technology

Dr. Martin Hamburger, New York University, Vocational education

Dr. John Easter, Stanford University, Research specialist

Dr. Elliott W. Eisner, Stanford University, Fine Arts

Dr. Jerrold Zacharias, Massachusetts Institute of Technology, Science

Dr. Alan Westin, Columbia University, Social Studies

Dr. Robert E. Branson, Parks Job Corps Center, Behavioral science

Disposition: -- This Master Plan was never adopted or followed because the request for $255,659.00 was cut initially to $50,000.00. However, this research plan, although radically curtailed, served as the basis for conducting the study during its first and second phases. The third and final phase designed for this segment of research in Bloomfield Hills was not funded.

FIGURE 1

BLOOMFIELD HILLS SCHOOLS CURRICULUM RESEARCH

TASK ANALYSIS

June 1, 1968 - May 31, 1969

TASK	INITIATORY DATE	PERSON(S) RESPONSIBLE	PERSON(S) INVOLVED	TARGET DATE
I To review current literature in the field	May 1, 1968	Dr. M. Jacobson		July 1, 1968
A. For designing behavioral objectives				
B. For constructing behavioral objectives				
C. For reviewing the demand for behavioral objectives				
D. For revising behavioral objectives				
II To explore available research studies to provide background knowledge	May 1, 1968	Dr. M. Jacobson		Aug.1, 1968
A. For information				
B. For data				
C. For instruments				
D. For research findings				
E. Other				
III To assemble, categorize, and denote the effects of interfaces [1] for all objectives				
A. Systems				
B. Disciplinary				
C. Non-disciplinary				

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[1] Definition of Terms in Appendix, p. 329.

TASK	INITIATORY DATE	PERSON(S) RESPONSIBLE	PERSON(S) INVOLVED	TARGET DATE
D. Terminal - Performance E. Interim - Performance	June 1, 1968	R. Boston M. Wendt	System Coord. Study Groups	June 14, 1968
IV To identify roles of consultants	May 1, 1968	R. Boston M. Wendt M. Jacobson		May 31, 1968
A. Area of expertise				
B. Program duties				
C. Research responsibilities				
D. Design of their involvement in the project				
V To contact other agencies for processing anything new with regard to objectives	May 1, 1968	R. Boston M. Jacobson		Sept. 1, 1968
A. Educational Testing Service				
B. C. O. P. E. D.				
C. A. I. R.				
D. I. D. E. A.				
E. Humanities Endowment Commission				
F. Westinghouse				
G. Xerox				
H. Stanford University				
I. Other				

TASK	INITIATORY DATE	PERSON(S) RESPONSIBLE	PERSON(S) INVOLVED	TARGET DATE
VI To construct criteria for assessment against the design	June 1, 1968	R. Boston M. Wendt	Consultants System Coord. Study Groups	Sept. 1, 1968
A. Analysis specifications à la Mager				
B. Analysis specifications for clarity				
C. Analysis specifications for "best fit"				
D. Performance sophistication required for achievement to be attained by minimum student				
E. Techniques for ordering behavioral objectives				
F. Techniques for sequencing the behavioral objectives				
G. Specifications for maximum and minimum sizes of learning steps				
H. Characteristic qualities to determine the essential substance required by the cognitive - skill pattern for each objective				
I. Characteristic qualities of skills classifications in the cognitive domain as differentiated from those in the affective or psychomator domain				
J. Reliability criteria for pre-requisites	July 1, 1968	R. Boston M. Wendt	System Coord.	Sept. 1, 1968
K. Validity criteria for pre-requisites	July 1, 1968	R. Boston M. Wendt	System Coord.	Sept. 1, 1968
VII To assess the design of the present K-12 behavorial objectives in all courses	Sept. 1, 1968	R. Boston M. Wendt M. Jacobson	Consultants System Coord. Study Groups Staff	Dec. 1, 1968
A. Critique of the experts				
B. Assessment of the design based on student achievement				

TASK		INITIATORY DATE	PERSON(S) RESPONSIBLE	PERSON(S) INVOLVED	TARGET DATE
	C. Assessment of the design based in interventions				
	D. Assessment of the design based on availability of published materials				
	E. Other				
VIII	To test the behavioral objectives against the evaluative criteria	Sept. 1, 1968	R. Boston M. Wendt System Coord.	Study Groups Administrative Staff	Feb. 1, 1969
	A. Analysis of behavioral objectives phrase by phrase for clarity				
	B. Analysis of behavioral objectives for meeting Mager's specifications				
	C. Analysis of behavioral objectives for meeting requirements determining maximum and minimum sizes of learning steps				
	D. Other				
IX	To test the behavioral objectives against the specifications of the curriculum design	Sept. 1, 1968	R. Boston M. Wendt System Coord.	Consultants Study Groups Administrators Staff	Mar. 1, 1969
	A. Analysis of behavioral objectives to determine the patterns for "best fit."				
	B. Analysis of behavioral objectives to examine the performance sophistication required for acceptable achievement of the minimum student				
	C. Analysis of the ordering of the behavioral objectives				

TASK		INITIATORY DATE	PERSON(S) RESPONSIBLE	PERSON(S) INVOLVED	TARGET DATE
	D. Analysis of the sequence of the behavioral objectives				
	E. Analysis of the essential substance of the behavioral objectives required by their cognitive skill patterns				
	F. Analysis of the pureness of the behavioral objectives in guarding the characteristic qualities for performance objectives in the cognitive domain				
	G. Other				
X	To cross-index the desciplinary and non-disciplinary objectives to develop inter-disciplinary objectives whenever expedient as indicated by the test analysis	On-going process	R. Boston M. Wendt	Consultants System Coord. Selected Staff Members	Mar.1, 1969
XI	To inventory published resource materials as they apply to the essential substance and related content vehicles for the behavioral objectives	May 1, 1968	R.Boston	System Coord.	Mar.1, 1969
	A. To gather recommended materials				
	B. To code these materials within the framework of the behavioral objectives				
XII	To test the reliability of course pre-requisites	June 1, 1968	R. Boston M. Wendt M. Jacobson	System Coord. Study Groups	Jan.1, 1969

	TASK	INITIATORY DATE	PERSON(S) RESPONSIBLE	PERSON(S) INVOLVED	TARGET DATE
XIII	To test the validity of course pre-requisites	June 1, 1968	R. Boston M. Wendt	System Coord. Study Groups	Jan. 1, 1969
XIV	To evaluate the several types of behavioral objectives A. Quality B. Appropriations C. Suitability	Jan. 15, 1969	R. Boston M. Wendt	Consultants System Coord. Study Groups	May 15, 1969
XV	To evaluate the component make-up of the behavioral objectives as a feature of the curriculum design A. Assessment instruments B. Internal evaluation C. External evaluation 1. C. O. P. E. D. 2. Planning Associates of New York City 3. National Assessment Program 4. Standardized tests	Jan. 15, 1969	R. Boston M. Wendt M. Jacobson	Consultants System Coord. Study Groups Outside Evaluators	May 15, 1969
XVI	To evaluate the present research study A. Satisfaction with the research design B. Effectiveness of the research model C. Efficiency for performing according to the research patterns D. Degree of success as indicated by the results of the study	Jan. 15, 1969	R. Boston M. Wendt M. Jacobson	Consultants System Coord.	May 31, 1969

TASK	INITIATORY DATE	PERSON(S) RESPONSIBLE	PERSON(S) INVOLVED	TARGET DATE
XVII To close the loop A. Revision of the behavioral objectives B. Reordering of the objectives in keeping with the recommendations of the persons involved C. Re-assignment of priorities to the Interim - Performance Objectives which lead to the attainment of the Terminal - Performance Objective, likewise, their path which assures achievement for fulfilling the System Objective. D. To produce a listing of the clusters of published materials associated with each of the behavioral objectives 1. Areas of compatibility 2. Levels of instruction 3. Importance of one item as compared with others for attaining a particular objective 4. Identification of the content vehicle inherent in the materials E. To link the revised objectives with the Bloomfield Hills sequential continuous progress curriculum, stated in behavioral terms, with complete articulation through the junior and senior high schools	Feb. 15, 1969	R. Boston M. Wendt	Consultants System Coord. Study Groups Staff	May 31, 1969

PROCEDURES FOR PHASE I (June 27, 1968 - October 15, 1968)

The procedures for carrying out this study differed considerably from the Task Analysis[1] derived from the planning program. The contract for the first four-month study was dated June 24, 1968 and the project was initiated June 27, 1968. From the conclusion of this phase of the project, Phase I, until the extension of the project, Phase II, was funded on January 3, 1969, the curriculum study based on the objectives of Grant 8-0653 was on "hold."

The Four-Month Study: -- Leading into the particular component of the total curriculum model affected by the stipulations of this project, a quality-control check had been made at the close of the 1967-1968 school year. As a result of a year of study and a summer curriculum workshop for those involved in continuous-progress, the curriculum became operational at the beginning of the 1967 school year. As illustrated in Figure 2, Figure 3, and Figure 4, these quality-control checks provided data for the several disciplines in the following categories: Pretests, Post-Tests, Student Packets, Availability of Materials, Adequacy of Materials, Profiles, Problems of Individualized Instruction Solved, Course Revisions, Additional Courses Needed, Schedule, General Comments or Recommendations. The results of these controls were then available for formulating the procedures of the study beginning in June.

The problem for this proposal having emerged from the recognition of a lack of a set of well-defined behavioral objectives, this study had been planned to fill an educational gap, to establish the specifications for achievement, to give supportive evidence for learning, and to contribute to the design of a systems approach. In addition, the need for this set of behavioral objectives was more greatly intensified to add another component in the development of the organic curriculum for the Educational System of the Seventies Project of the United States Office of Education. However, the original design and prescribed plan, described in Chapter II, were curtailed considerably as the result of a reduction in the project budget. The objectives relevant to the Four-Month Project were carefully identified which eliminated the balance of the objectives stated in the original proposal. Accomplishments were to include the criterion methods for assessment against the design of behavioral objectives à la Mager. The following provided analysis for six areas of behavioral specifications:

(1) Structure,
(2) Clarity,
(3) "Best fit,"
(4) Order and/or rank,
(5) Sequence, and
(6) Essential skill substance.

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[1] Figure 1, p. 23.

FIGURE 2

QUALITY CONTROL CHECK - CONTINUOUS PROGRESS SCHOOLS

1968 - 1969

This quality control check is designed to help assess the current status of our continuous progress curriculum and to reflect, as a part of the evaluation throughout the year, the accomplishments of each professional staff member. Please answer the following questions for each course in your subject area that you teach by checking the appropriate point on the scale provided. This check will be made in September, February, and May. If less than 25% complete, leave blank.

COURSE TITLE____________________ TEACHER____________________________

Percent 25 50 75 100		
/ / / / /	Sept.	1. What percent of the course has been defined in behavioral objectives?
/ / / / /	Feb.	
/ / / / /	May	
/ / / / /	Sept.	2. For what percent of your course have course objectives been established?
/ / / / /	Feb.	
/ / / / /	May	
/ / / / /	Sept.	3. What percent of the designed activities complement established course objectives?
/ / / / /	Feb.	
/ / / / /	May	
/ / / / /	Sept.	4. What percent of the designed activities complement and fulfill the system objectives?
/ / / / /	Feb.	
/ / / / /	May	
/ / / / /	Sept.	5. For what percent of your course objectives has a time line been established?
/ / / / /	Feb.	
/ / / / /	May	
/ / / / /	Sept.	6. Do you have progress charts for maintaining student progress objectives?
/ / / / /	Feb.	
/ / / / /	May	

/ / / / / Sept. 7. To what extent are necessary materials (commercial/teacher prepared) prepared and available?

/ / / / / Feb.

/ / / / / May

/ / / / / Sept. 8. What percent of the student packets are completed for individualized instruction?

/ / / / / Feb.

/ / / / / May

/ / / / / Sept. 9. What percent of the content taught in your course is outlined in a teacher packet with content, method, materials, and evaluation?

/ / / / / Feb.

/ / / / / May

Please provide specific answers to the following:

10. What help do you feel you need to overcome problems of individualizing instruction in this course (providing for a variety of learning strategies to be going on simultaneously)?

Sept.

Feb.

May

11. Does the present schedule (frequency of class meetings, length of class periods, etc.) seem adequate for the type of instruction dictated by this course?

Sept.

Feb.

May

12. On the back of this sheet, please list any general comments, suggestions, or problem areas on which we might join efforts to improve the curriculum in your area.

FIGURE 3

Elementary Quality Control Check

Name____________________ Date____________________

Subject____________________ School____________________

1. What revisions do you feel should be made in the objectives for this subject? (sequence, additions, minimum standards, etc.)

2. For which objectives (please list by number) in this subject area do you feel that available student-centered materials are inadequate to individualize instruction? Consider both teacher-developed and commercially prepared materials.

3. What revisions would you recommend in your student materials? Be specific. Indicate precisely which packets and which activities need to be revised.

4. List any general recommendations you might have for improving instruction in this subject area.

FIGURE 4

Secondary Quality Control Check

Name________________________ Date________________________

Course________________________ School________________________

1. How many objectives must a student complete to receive course credit?________

   How many of the total course objectives are presently stated in behavioral terms, reflecting the cognitive process needed for attainment? ____________

2. Are revisions necessary in your course objectives? __________ If so, specify the type(s) of revisions needed. (sequence, time estimated, minimum performance standards, etc.)

3. For how many course objectives do you have adequate student-centered materials to individualize instruction? Include both teacher-developed and commercially prepared materials. (packets, activity sheets, worksheets, multi-media, range of achievement levels, etc.)

4. What revisions would you recommend in your student-centered materials or your teacher packets? Be specific. Indicate precisely which packets and which activities need to be revised.

5. List any general recommendations you might have for improving this course.

Note: If additional writing space is necessary, please use back of sheet.

A variety of sources were to feed information into the project for assessing the design of the behavioral objectives in all courses. Consultants were to examine the design, to look objectively at the product as revised, and to make recommendations for continuing the research during the coming year. Data from student achievement would be forthcoming after the opening of school in the fall. With students completing self-instructional packets as planned, representative samples of data would be available after the middle of October. The behavioral objectives were to be examined in light of the specifications of the evaluative criteria and the specifications of the curriculum design. To the extent possible the cross-referencing of the objectives and the inventorying of resource materials available would be undertaken as they were relevant to the primary purpose for revising the behavioral objectives of the experimental curriculum.

Source of Program Data

Major research activities: -- The research design indicating the selection of a group of teachers, coordinators, and administrators was to be implemented beginning with orientation conferences the first of which was scheduled for June 27, 1968. During these conferences the participants would be informed of their responsibilities for reviewing the behavioral objectives for their respective disciplines, for assessing strength and weaknesses of their objectives based on the evaluative criteria, and for revising them or creating new objectives as required following the evaluation examination. In addition to this primary emphasis of the experiment during this first four-month period, the members of the staff were asked to classify the quantities of materials, methods, and media available for building learning interventions to determine the extent the behavioral objectives would be realistic to serve as the basis for instruction. Concomitant to these activities, the participants were to inventory published resource materials available and to encode them as they would apply to the essential substance of the behavioral objectives and the related content which would perform the function of the instructional vehicle for fulfilling the objectives.

After July 1 the participants were to work in groups according to subject matter areas. These groups were to be supervised and coordinated by supervisory personnel and to meet a minimum of once a week with Miss Wendt, Project Director, and Mr. Boston, Assistant Superintendent for Curriculum, and more often than this one scheduled conference, if possible. The System Coordinators were also to be involved in group conferences as well as in the supervision of the activities for their respective disciplines.

The participants were to complete the Evaluation Sheet indicating the quantity of revisions, deletions and additions made in accord with the various characteristics of the criteria (Figure 5).

FIGURE 5

OBJECTIVE EVALUATION SHEET

Name_______________________________ Date ____________________

Course/Subject Area________________________________

REVISIONS BASED ON: ADDITIONS MADE:

Objective No.	à la Mager - 4 parts	clarity	minimum performance	time factor changed	objective eliminated	Objective replaced (same no. –entirely new)	New objective (course and/or no.)	sequence change (indicate previous no.)	materials added (commercial)	materials added (teacher-developed)	learning strategies added	pre-tests developed	post-tests developed	prerequisites identified	coded to discipline obj.

Please check the following items when they have been completed for this subject.

____Individual student progress chart
____Class progress chart
____Report form for parents

____Materials organized for classroom implementation
____Recommendations for additional materials submitted

By July 8, the staff members were to submit their recommendations for revisions of the behavioral objectives previously established, a rough draft of proposed objectives to replace those discarded, and objectives to serve as behavioral courses. These revisions were to be based on seven criteria for evaluation:

(1) The four parts of a Magerian objective,
(2) Clarity,
(3) Minimum performance requirements,
(4) Time factor need,
(5) Objective no longer acceptable,
(6) Replacement objective, and/or
(7) New objective.

Reports would include additions made by way of sequence changes, commercial and teacher - developed materials added, learning strategies added, pre- and post-tests developed, prerequisites identified, and coding of the course objectives to the discipline objectives.

Then before July 24 the following results of the study were to be assembled for each discipline:

(1) The final draft of each objective for every course,
(2) Each course objective coded to the discipline objective,
(3) Time estimate in terms of class periods stated for each objective,
(4) Number of objectives an individual student must complete to receive course credit.

Part 4 indicates the number of objectives which represent the basis for reporting purposes. That is, they were to state whether this number included terminal - performances objectives, and/or combinations of terminal - performance, interim - performance, and basic - skill objectives. The latter are the minimum basic skills expected of all students before they would be considered as candidates for high school graduation.

The design for this curriculum construction includes the various types of behavioral objectives which stipulate the criteria for evaluating the demonstration of skill at a given level of sophistication. These objectives contain the how, the what, and the degree of accuracy required before the learner demonstrates the desired skills. The method of evaluation used is also stated in the objective.

Among the types two different kinds of objectives of a comprehensive nature have been developed for cross-indexing objectives for the several disciplines. At the highest level there are the Systems Objectives designed to define inquiry and communication as the skills of learning how to learn. In these statements there are no specifications for student performance given. At the second level the Discipline Objectives define mental processes through which a learner develops inquiry and communication skills. These objectives can not be obtained without content as the vehicle. Moreover then, the specifications for student performance reflect dependence on the content. The statement is given in the form "with accuracy equal to or greater than the predetermined minimum level."

Reflected in discipline objectives are the Terminal - Performance Objectives. They translate the skills and content the students must be able to perform at the completion of learning experiences. Certain characteristics of the discipline for which an objective is written determine the amount of content written into this terminal objective and, consequently, whether or not a percentage value or other performance specification is attached. If the terminal - performance objective is peculiar to only one task or lends itself only to stated content, then specifications for evaluation are required. However, if the content can be altered to fit the interests or other characteristics of students, then the specifications for evaluation must be open-ended to allow for this versatility. Like a terminal - performance objective, an interim - performance objective may represent only a general outline of the content or it may be very specific, dependent upon the discipline content and/or the skill within the discipline. Basically, an interim - performance objective states the minimum degree of accuracy acceptable for completion of the objective.

To coordinate with the cognitive specifications described above, the objectives for attaining the Communication Skills were to be revised in toto. They are: Reading Skills, Listening Skills, Writing Skills, Oral Skills, and Research - Location Skills. The five categories of these skills were to be revamped to tie in with the levels of the Discipline Objectives.

By August 24 the participants were to have reviewed the behavioral objectives and completed the revisions in all courses.

Results to be used for data collection: -- This task was to be accomplished by adherence to steps producing the following:

(1) Review of the Discipline Objectives for each subject area,

(2) Revision and/or reorganization of the Terminal - Performance Objectives in light of the Discipline Objectives,

(3) Revision of the Interim - Performance Objectives, if necessary, to fit the Terminal - Performance Objectives,

(4) Evaluation of each Interim - and Terminal - Performance Objective in terms of

(a) Minimum performance standards, Criterion: How realistic are these standards for ensuring the success of the minimum-achieving student?

(b) Five limits defined for each objective,
Criteria: Are these limits realistic for students who work at a "normal" rate? Can the objectives be completed in light of the sixty percent of the class time for individualized instruction which is devoted to their attainment?

(c) Clarity of specifications, and

(d) Prerequisite skills necessary.

Sample of procedures undertaken for a discipline during Week I: -- Given

(1) Former Terminal - Performance Objectives and Interim - Performance Objectives as compiled by teachers,

(2) The Discipline Objectives compiled by Dr. Boston,

(3) Guidelines of responsibilities for carrying out the study,

(4) Time chart for mapping progress in the subject area.

Procedures of Discussion Session 1

(1) To study new and original behavioral objectives, keeping in mind how the course objectives would fuse with the discipline objectives.

(2) To propose additions or new objectives to fill in gaps evidenced by the study.

Procedures of Discussion Sessions 2 through 5

(1) To delegate duties for covering all given responsibilities

(a) Specific areas of the discipline objectives were to be assigned to each participant representing the discipline,

(b) Old objectives were to be rewritten and fitted together according to the coding of the discipline objectives for this subject matter,

(c) A quality-control check was to be accomplished for the behavioral objectives to critique the revisions,

(d) An editing session was to be held for each objective,

(e) The edited materials were to be prepared for use by the participants

(f) All the objectives were to be classified and ordered for the interim - and terminal - performance - objective sequences.

(g) A second quality - control check was to be effected to critique the order and sequence of the performance objectives.

(2) To lay plans to use as guidelines for directing activities during the second week.

PROCEDURES FOR PHASE II (March 24, 1969 - October 15, 1969)

This project did not receive funds from the Office of Education until the Spring of 1969. As a result this phase of the project did not begin until March 24, 1969. Nevertheless, rather than a change of direction from the overall plan, this continuation project made it possible for the project staff to go back to the original task analysis and to consider its objectives from the vantage point of the time orientation for Phase II. Thus, the patterning of this research phase permitted the elements of this project to feed into the main stream of curriculum construction to attain the objectives of the original research design and to revise and refine the behavioral objectives in light of the accepted criteria. The specific objectives which defined the outcomes for this period were described by discipline in Figure 6.

FIGURE 6
TASK ANALYSIS

A Study of Performance Objectives To Serve as a Model for Individualizing Instruction
Project No. 080653 Bloomfield Hills, Michigan

TASK	PERSON(S) RESPONSIBLE	PURPOSE	FIELD OF STUDY
To Examine Written - Communication Skills	Beverly Eby	Critique of behavioral objectives for communication skills a. Content b. Sequence c. Recommended additions	Humanities
To Examine Course Objectives	Charles Phillips Barbara Weingarden	1. Review of cumulative aspect of course objectives 2. Review of multiple-skill content of each course objective	Foreign Language
To Examine Terminal-Performance Objectives	Donald Rolston Dennis Travis Karen Nelson	1. Organization of life processes 2. Cognitive level for vertebrates	Science
To Examine Instructional Materials		1. Format of teacher-information materials 2. Coding system for student materials 3. Materials needed for implementation	Science

TASK ANALYSIS (Cont.)

TASK	PERSON(S) RESPONSIBLE	PURPOSE	FIELD OF STUDY
To Examine Terminal-Performance Objectives and Materials	Kerry Price Julie Kendall	1. Review of major objectives 2. Organization of student materials 3. Relationships with the design for an individualized instructional program	Music
To Examine Materials	Nancy Stein Gordon Clark	1. Recommendation of additional worksheets 2. Critique of materials to develop elements of set theory	Mathematics
To Examine Objectives	Charles Phillips Barbara Weingarden	1. Review of objectives a. Discipline Objectives b. Terminal-Performance Objectives c. Course Objectives 2. Construction of format for encoding commercial materials	Spanish I Spanish II Spanish III Spanish IV
To Critique and Reorganize	Leslie Berman	1. Procedures for evaluating concepts and skills 2. Relationships of pretests 3. Reorganization of C3.0 and C4.0 on plants	Science

TASK ANALYSIS (Cont.)

TASK	PERSON(S) RESPONSIBLE	PURPOSE	FIELD OF STUDY
To Examine Objectives		1. Critique of terminal-performance objectives 2. Critique of course objectives 3. Discussion of materials appropriate for a "problems" approach 4. Agreement upon a resource-type text	Advanced Biology
To Examine Objectives and Methods	Loren Bloetscher	1. Critique of objectives 2. Critique of methods 3. Relationships of laboratory versus text activities 4. Investigation for development of thinking skills of generalizing on transferring from one activity to another	
To Encode Materials	Barbara Herrman	1. Examination of probability packet 2. Examination of SRA Drilltapes as possible media for encoding	Mathematics
To Examine Objectives	Roy Monzo	1. Critique of junior-high program 2. Recommendations of additions and modifications for objectives 3. Recommended modifications in equipment to be compatible with objectives	Industrial Education

TASK ANALYSIS (Cont.)

TASK	PERSON(S) RESPONSIBLE	PURPOSE	FIELD OF STUDY
To Examine Objectives	Bill Hyry	1. Clarification of Discipline Objectives 2. Revision of Algebra 1 Objectives	Mathematics
To Examine Objectives	Kay Hood	1. Specifications of objectives for concepts 2. Encoding of commercial materials to objectives	Humanities
To Examine Objectives and Encode Materials	Chris Bruner	1. Critique of objectives for feeder program 2. Encoding junior-high reading materials to basic skills	Humanities
To Relate Various Types of Objectives to One Another	Paul Sparre Linda Lopshire	1. Review of relationships of various types of objectives to one another 2. Critique of focus on MAN and what is to be gained by a study of him 3. Critique of introduction to course 4. Critique of definitions and examples of terms	Humanities
To Organize and Encode Materials		1. Organization of Conceptual Scheme D (living things) 2. Designation of classification of content and grade level of materials	Science

TASK ANALYSIS (Cont.)

TASK	PERSON(S) RESPONSIBLE	PURPOSE	FIELD OF STUDY
To Write Objectives	Bill Hyry	Construction of a uniform format for writing objectives	Mathematics
To Revise Terminal - Performance Objectives	Alice Merrick Paul Gwinn	1. Examination of objectives involving fractions 2. Revision of terminal-performance objective(s) concerned with naming fractions in their simplest terms	Mathematics
To Examine New Mathematics Materials	Paul Gwinn	Implementation of new math materials	Mathematics
To Critique Methods and Materials		1. Conceptual scheme for "American Values" 2. Use of role playing as a method 3. Role-playing materials to be encoded according to the situation 4. "Fit" of reading skills within the humanities program a. To utilize student interests b. To relate values with interests c. To interpret author's values as reflected in his writings	Humanities

TASK ANALYSIS (Cont.)

TASK	PERSON(S) RESPONSIBLE	PURPOSE	FIELD OF STUDY
To Relate Materials to Objectives		1. Changes recommended for the "Equal Rights and Liberties" packet 2. Construction of skill lessons 3. Encoding specific references for various activities	Seventh-Grade Humanities
To Examine Objectives		1. Critique of objectives at feeder level 2. Referencing multi-level materials to attain objectives	
To Specify Objectives	Leslie Berman	1. Specifications of objectives for C4.0 2. Organization and development of student materials	Science
To Encode for Objectives	Charles Phillips	1. Critique of procedures for encoding commercial materials to each objective 2. Referencing multi-media approach	Foreign Language
To Examine Objectives	Kerry Price	1. Articulation between junior high and senior high school 2. Critique of objectives for general music 3. Critique of objectives for choir	Music

TASK ANALYSIS (Cont.)

TASK	PERSON(S) RESPONSIBLE	PURPOSE	FIELD OF STUDY
To Examine Objectives	Loren Bloetscher	1. Specifications of objectives 2. Relationships of course objectives to discipline objectives	Physics
To Organize Materials for Objectives		1. Critique of teacher information for DO 1.0 and DO 2.0 (Living Things) 2. Organization of student materials for DO 1.0 and DO 2.0 (Discipline Objectives)	
To Examine Objectives	David Mortimer	1. Specifications of objectives 2. Construction of a resource file for teachers	Humanities

Spring Workshop (April 16, 1969 - May 29, 1969)

Phase II was planned to place greatest emphasis on a newer aspect of the curriculum design, namely, the Course Objectives. These efforts would include the extent course prerequisites are compatible with the performance specifications of the objectives.

All disciplines have discipline objectives for cross-indexing the common skill levels horizontally and referencing them vertically to the cognitive processes of learning. Course objectives have, by and large, been constructed which measure course achievement in performance specifications. These course objectives are to be field-tested, gaps identified, and these gaps are to be closed. Then the course objectives are to be field-tested further for acceptability.

As a continuation activity for the project, off-the-shelf materials, as well as teacher-prepared materials are to be encoded for the objectives. The field test would then reflect the desirability of using these materials. Students at various levels of instruction would utilize these materials in combination with selected methods to produce a multi-media learning setting.

Tasks of the Research Study Groups

1. Review of original design,

2. Quality-Control Checks referenced to plan course of action for subject-matter areas,

3. Revision of all objectives to fit hierarchy

    a. System Objectives,
    b. Discipline Objectives,
    c. Terminal-Performance Objectives,
    d. Interim-Performance Objectives,
    e. Course Objectives and Basic Skills,

4. Encoding of off-the-shelf materials,

5. Relating locally prepared materials to objectives,

6. Relating other student-centered materials, including their many options for students with a variety of interests,

7. Revision of objectives, if necessary, based on the availability of commercial materials.

Source of Program Data

Teachers recommended to work in the Spring Workshop or their counterparts were to be released from their classroom responsibilities during the normal school day on the dates for their meetings. Their classrooms would be handled through the employment of substitutes.

Recommendations of arrangements for the Spring Workshop: -- Lahser High School was to house the research group because satisfactory space would be available throughout the school day, Saturdays, and evenings with numerous rooms to be available, left free for the summer. Lahser was also selected because of its central location with regard to the three project schools. Another attractive feature is its central air-conditioning.

The curriculum study groups were to be conducted during the regular school day with teachers, coordinators, and supervisors meeting in small subject-area subgroups according to the spring schedule in Figure 7.

FIGURE 7
SPRING WORKSHOP MEETING SCHEDULE
April 16, 1969 - May 29, 1969

Days	Time	Subjects	Approximate Number of Teachers
Monday-Wednesday	8:30 - 11:30 a.m.	Science, Art, Music Foreign Language	12
Monday-Wednesday	12:00 - 3:00 p.m.	Mathematics, Physical Education, Industrial Arts	7
Tuesday-Thursday	12:00 - 3:00 p.m.	Humanities, Language Arts	12

The preceding schedule indicates the maximum any given group would meet per week. On most occasions two teachers from the same area and/or instructional level would alternate with one of them attending each session. Teachers without much skill in curriculum production but who would be knowledgeable about implementation techniques were to be invited to join the study groups in a brainstorming session two or perhaps three times a month.

Major Activities for the Spring Workshop

1. Industrial Education

a. Encoding off-the-shelf materials to objectives,

b. Relating instructional materials to revised objectives,

c. Constructing and revising objectives for machine technology,

d. Describing the behavioral components of the terminal-performance objectives for measurement,

e. Identifying the intralationships of the terminal-performance objectives,

f. Revising objectives to reflect more content specificity.

2. Mathematics

a. Evaluating junior high school instructional materials for attaining objectives,

b. Constructing Course Objective 16 on probability and the accompanying instructional materials,

c. Revising the terminal-performance and interim-performance objectives for Algebra I,

d. Revising the terminal-performance and interim-performance objectives for Algebra II,

e. Determining minimum-performance standards for all terminal-performance objectives,

f. Developing a standard uniform format for all secondary mathematics objectives,

g. Studying recommended additions and deletions in the junior high school program,

h. Gathering feedback information from the mathematics staff,

i. Constructing objectives for model construction and model identification at several levels of instruction,

j. Planning pretest for readiness objectives.

3. Business

a. Constructing model objectives for shorthand,

b. Constructing model objectives for advanced accounting,

c. Defining course objectives in behavioral terms,

d. Reflecting appropriate content in the course objectives,

e. Eliminating problem of identifying terminal-performance objectives accurately whenever several TPO's are partially fulfilled by a single course objective.

4. Physical Science

   a. Studying distinction between construction criteria of "to hypothesize" and "to predict" for objectives,

   b. Developing the concept describing evaluation procedures for Course Objective 4,

   c. Establishing a multi-level resource file of experiments to correlate with performance objectives,

   d. Coding audio-visual materials to objectives,

   e. Specifying terminal-performance objectives,

   f. Cross-indexing course objectives that fulfill more than one terminal-performance objective,

   g. Studying relationships between and among all objectives in the cognitive hierarchy,

   h. Studying relationships of the course objectives to the terminal-performance objectives and the interim-performance objectives,

   i. Recommending course adjustments for low achievers which include text materials and achievement in mathematics,

   j. Planning articulation by cross-indexing physical science and mathematics objectives.

5. Biology

   a. Studying the need for a living-science course for low-level achievers,

   b. Evaluating the performance criteria of the objectives for minimum-course requirements,

c. Revising objectives for study of ecology,

d. Constructing time lines and evaluations for all biology objectives,

e. Revising objectives for the study of genetics,

f. Constructing instructional materials for the study of genetics to accompany minimum requirements of the objectives.

6. Music

a. Constructing and revising objectives,

b. Organizing student instructional materials for strings program to accompany objectives,

c. Completing break down of task analysis for sight reading,

d. Defining of specific-skills media for sight reading.

7. Foreign Language

a. Encoding off-the-shelf materials to accompany communication-skills objectives for original composition,

b. Encoding off-the-shelf materials to accompany inquiry and research-location skill objectives for literature,

c. Developing additional student-instruction materials for Level I objectives,

d. Encoding off-the-shelf materials to accompany objectives for Level III and Level IV.

8. Humanities

a. Studying problems caused by encoding multi-texts due to vocabulary differences among these resources,

b. Looking at interdependence among writing skills,

c. Designating level of objectives and level of content,

d. Categorizing materials and activities for the content of the objectives in the following areas

(1) Focus on contemporary man as he attempts to resolve contemporary problems,

(2) Emphasis on the basic problem of communication,

(3) Use of a wide variety of interest modes giving the students maximum flexibility of choice,

(4) Examination of contemporary world problems through man's forms of expression -- political, economic, social, etc.

(5) Study of relationships between cognitive processes and cognitive skills,

(6) Selection of units to fulfill objectives,

(7) Utilization of several objectives within the framework of a single unit,

(8) Revision of objectives for unit concerning Equal Rights and Liberties,

(9) Organization of objectives around problem-themes,

(10) Sequences for objectives of the concepts to be presented in the introduction,

(11) Development of evaluation criteria for all objectives,

(12) Study of recommended revisions for the objectives reflecting the unit of Equal Employment,

(13) Critique of objectives,

(14) Discovery or creation of potential content to implement objectives,

(15) Description of objectives for American Cultures' course

(16) Construction of objectives for the Conflict theme,

(17) Critique of evaluations for reading objectives,

(18) Revision of objectives in Overview unit,

(19) Revision of objectives for Brotherhood unit,

(20) Study of utilization of literature to attain objectives,

(21) Use of Scholastic Prejudice unit to introduce literature into the Overview unit,

(22) Use of two basic types of materials to fulfill objectives: resource file of activities (coded to objectives) and thematic units (also coded to objectives),

(23) Development of model set of behavioral objectives.

Summer Workshop (June 23, 1969 - August 1, 1969)

The Summer Workshop was planned to complete certain tasks in compliance with the objectives of the proposal. The following were the objectives of the workshop:

1. To assess the Bloomfield Hills performance objectives in toto and their separate components in order to assure uniformity in the style and structure as described by the established criteria,
2. To collect data for assessing the design of the accepted behavioral objectives to classify them for building learning interventions,
3. To continue with the preparation of an inventory of commercially prepared resource materials available within the local school district which apply to the essential skills and related content plus the construction of a list encoding these materials within the performance framework of the objectives.

The tasks which were to be completed were based on the methods for attaining these objectives. Some of the tasks were highly specialized and would require only a limited number of the members from the study groups while others would necessitate involvement on the part of nearly all of the participants. A list of the tasks included the procedures:

1. To assemble and to classify all the objectives -- System Objectives, Terminal-Performance Objectives, Interim-Performance Objectives, and Course Objectives,
2. To construct the research design for evaluating the total continuous-progress curriculum,
3. To complete discipline-objective models describing all the cognitive processes,
4. To test the objectives against the requirements of the curriculum design,
5. To inventory and to encode available commercial materials,
6. To assess the quality of the objectives as they reflect the evaluative criteria.

The workshop was to begin on June 23 and continue through August 1. It was to be conducted at Lahser High School, the experimental school for the ES '70 Project sponsored by the Bureau of Research of the U.S. Office of Education. The following fields would have participants in the workshop: art, behavioral sciences, business education, foreign language, home economics, humanities, industrial education, mathematics, music, physical education, and science. The full-time members of the workshop were to have hours from 8:00 a.m. until 3:30 p.m.; part-time members were to arrange their hours with Miss Wendt, the Project Director. Plans called for training sessions to be held at Lahser High School on June 18 and 19. In addition to a description of their responsibilities, the leaders were to be presented a task-analysis prototype to be used in conjunction with the technical terminology of the continuous-progress curriculum.

Source of Program Data

Agenda for Opening Session

1. Welcome -- Supt. Eugene L. Johnson,

2. Research in the Bloomfield Hills Public Schools: THE STATE OF THE ART -- Marilynn S. Wendt,

3. The Research Project To Revise Behavioral Objectives -- Asst. Supt. Robert E. Boston,

4. Individual Conferences and/or Small-Group Seminars,

5. Follow-Up Plans under Consideration As the Project Is Extended.

Training Session 1

1. Presentation by Dr. Edward Bantel, Oakland University, to alert staff to the process of individualizing instruction of the address, "The Learning Process, the Individual, and the Curriculum,"

2. Small groups to meet after this presentation to consider implications and strategies based on various educational assumptions supported by research and to compile a master list,[1] a resultant of these discussions,

3. Small subject-area groups to meet for suggesting strategies relevant to their respective disciplines, these strategies to be based on the master list of implications,

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[1] Appendix A, p. 300.

4. The total group to meet in order to reach a consensus on the implications having general applicability to all subject areas. (These implications and their corresponding strategies were to form the basis for curriculum development throughout the summer workshop.)

Training Session 2

1. Presentation of an overview of the philosophy of the continuous-progress program,

2. Presentation of a sample task analysis[1] for content and for skill,

3. Assignment of groups of participants to various workshop leaders to study the following tasks

    a. To relate behavioral objectives to taxonomy,

    b. To relate behavioral objectives to implications defined on preceding day,

    c. To explain form to use in analyzing student profiles,

    d. To have members begin a statistical analysis,

    e. To recommend changes and revisions based on the analysis.

Training Session 3

1. Distribution of copies of the tasks to be completed during the workshop with plan to begin work on the tasks,

2. Formal introduction of behavioral objectives,

3. Clarification of relationships between interim-performance objectives and terminal-performance objectives,

4. Discussion of criterion measures for each objective,

5. Introduction of the System Objectives, the Discipline Objectives, and the accompanying taxonomy of the curriculum design.

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[1] Appendix B, p. 302.

Training Session 4

1. Assignment of a "buddy" for each new staff member, a person he can go to for help and direction,
2. Distribution of workshop responsibilities,
3. Identification of tasks which need to be accomplished, ranking them on a priority basis and assigning them to group members who demonstrate most interest and competence,
4. Completion of an individual task-analysis form by each group-member which indicates his weekly goals in relation to his task(s),
5. Orientation to acquainting members with materials currently available, revisions previously recommended, special equipment available, revisions previously recommended, etc.

Training Session 5

1. Informal meetings with each subgroup to determine
    - a. Whether tasks to be completed have been adequately defined,
    - b. Whether individuals have been assigned specific responsibilities in relation to the tasks,
    - c. Whether individuals feel comfortable with their assigned tasks,
    - d. Whether any special problems have been encountered.
2. Discussion to determine recommendations for improvement

Tentative Plans for Conducting Workshop

1. Schedules for Mr. Boston and Miss Wendt to critique study-group production
    - a. Mondays -- Science and Music
    - b. Tuesdays -- Industrial Education, Physical Education, and Art,
    - c. Wednesdays -- Speech and Drama, Foreign Language, and Behavioral Science,
    - d. Thursdays -- Business,
    - e. Fridays -- Humanities and Mathematics.

2. Tentative Schedules for Subject Area/Group Meetings

   a. Tuesdays

      (1) Senior High -- Humanities, Mathematics and Science,

      (2) Junior High -- Language Arts and Mathematics,

   b. Wednesdays

      (1) Senior High -- Music, Industrial Education, and Physical Education,

      (2) Junior High -- Art, Humanities, and Science,

   c. Thursdays

      (1) Senior High -- Behavioral Science, Speech, Foreign Language,

      (2) Junior High -- Science and Humanities.

3. Tentative Schedules for Discussion Groups (8:00 a.m. - 3:30 p.m.)

   a. Day A (8:00 a.m. - 3:30 p.m.)

      (1) Group Critiques,

      (2) Science,

      (3) Mathematics,

      (4) Group Critiques,

   b. Day B (8:00 a.m. - 3:30 p.m.)

      (1) Group Critiques,

      (2) Junior-High Humanities,

      (3) Other* (AM Group),

      (4) Senior-High Humanities,

* Other: Includes Industrial Education, Home Economics, Foreign Language, Music, Art, Business Education, and Physical Education.

(5) Other (PM Group),

(6) Group Critiques,

c. Day C (8:00 a.m. - 3:30 p.m.)

(1) Group Critiques,

(2) Science,

(3) Mathematics,

(4) Group Critiques,

d. Day D (8:00 a.m. - 3:30 p.m.)

(1) Group Critiques,

(2) Senior-High Humanities,

(3) Other (AM Group),

(4) Junior High Humanities,

(5) Other (PM Group),

(6) Group Critiques.

General Information

1. Workshop Hours (Full-Time)

8:00 a.m. - 12:00 p.m.,

12:30 p.m. - 3:30 p.m.

2. Dates: June 23 - August 1 (Except July 4).

3. Room Assignments

(a) All workshop conferences held at Lahser High School,

(b) Total Group meetings in the Commons,

(c) Humanities

(d) Mathematics

(1) Junior High -- Room 307,

(2) Senior High -- Room 308,

(e) Foreign Language -- Seminar Room 401 and/or Room 400,

(f) Home Economics/Art/Industrial Education -- Home Economics Area,

(g) Music -- Music Offices/Practice Rooms,

(h) Business -- Rooms 501-505,

(i) Physical Education -- Library Seminar.

4. Co-Sponsorship of Summer Curriculum Workshop by Wayne State University

(a) Two courses granting nine hours credit each available in Education 6014, Local School Curriculum Planning,

(b) Dr. Ronald Ulrich, instructor with experience working with behavioral objectives and individualized instruction, to supervise for Wayne State University.

5. Production of results to be expected from the concerted efforts of small subgroups, individual participants, and sub-contractors

(a) Revised behavioral objectives,

(b) Behavioral objectives for new courses,

(c) Newly constructed behavioral objectives to fill gaps and to complete courses,

(d) Lists of appropriate instructional materials coded to behavioral objectives,

(e) Curriculum guides containing essential instructional information for teachers,

(f) Self-Instructional Materials for students, and

(g) Field-Test Results.

PREPARATION OF FORMS

During the span of time for Phase I and Phase II of. this project, different types of forms were drawn up, administered, and assessed for their value in obtaining data.

The samples of application forms produced information pertaining to anyone connected with the project: teachers, administrators, supervisors, and consultants. The Personnel Data Sheet and the Consultant Inventory completed were to give evidence of training, experience, and background for selecting those persons who should be able to contribute to the data and competent within the scope of their specialties.

The application to participate in the seminars under the direction of Dr. Edward Bantel for Oakland University is an example of opportunities in Bloomfield Hills. They were to be offered as a follow-up to the Summer Workshop based on the study of ecological problems in education, per se, and educational psychology.

Payroll reporting required new forms flexible enough to adjust to total hours varying from day to day and from week to week. The Hourly Employees Pay Report has columns for tabulating the number of hours worked morning and afternoon daily. These figures can then be transferred to the Summer Curriculum Workshop Pay Report which totals the number of hours for each Pay Period. These individual forms serve, finally, to cumulate the total payroll for a pay period needed by the Bloomfield Hills Business Office.

Forms were constructed to give direction to workshop participants. These included charts informing the study groups which times and places had been set aside for their subject area/group meetings. These two forms were the Summer Curriculum Workshop Weekly Schedule and the Summer Curriculum Workshop Discussion-Group Schedule. Other forms listed workshop responsibilities, provided a format for the staff to organize their plans of work, gave the participants the opportunity to order materials, equipment and supplies, and identified in terms of the project objectives at what point staff members were ready to begin. Such forms included Curriculum Workshop Responsibilities -- Secondary, Directions for Completing Work Plan, Summer Curriculum Workshop Tentative Work Plan, Special Equipment/ Textbook Materials/ Supplies, and Content Covered.

Materials used for the training sessions were constructed for the individual study-group member. He was to have practice in analyzing a general statement and deducing from it implications which would be more specific in relation to continuous-progress. A chart was also constructed which described the relationship between the inhibiting and facilitating factors as they affect the present performance of the learner. Practice materials were also prepared establishing a ganeral outline and a sample for utilizing the technique of task analysis. These techniques would then apply to the forms for building learning strategies in developing the program. These materials are identified as follows:

FIGURE 8
SUMMER CURRICULUM WORKSHOP

GENERAL INFORMATION:

1. Turn in Personnel Data Sheet (buff) if you haven't already done so.

2. COURSE TIME LINES should reflect a 60/40 time distribution as follows:

   Full year course: 108 days in individualized activities
   72 days in depth or enrichment activities

   Half-year course: 54 days in individualized activities
   36 days in depth or enrichment activities

3. NUMBERING IPO's: All course IPO's are to be numbered in sequence, 1.1, 1.2, 1.3, ...and coded to the discipline objectives in the left margin. Please do NOT follow the pattern of the Investment Packet, skipping IPO numbers to maintain the parallel with the DO number.

4. REPORT CARD-DETERMINING OBJECTIVES

   Report cards should reflect the number of COURSE OBJECTIVES a student must complete to receive a credit. A realistic number would be approximately 15-35 so that students would be completing an average of one objective every 1-3 weeks.

COURSE OBJECTIVES

Because several courses have only 5-6 major TPO's and students work on only parts of one or more IPO's/TPO's during a given marking period, these partial objectives fulfilled in individual packets or lessons may be classified as course objectives. That is, Course Objective 1 may include IPO's 1.1a, b; 1.2a, b; 1.3a, b; 1.5. Course Objective 2 may include IPO's 1.1c, d; 1.2c, d; 1.3c, d; 1.5, etc.

5. STUDENT PACKETS

   Each student packet must include the following:

   1. A statement of what the student is expected to accomplish (the objective stated in student vocabulary)
   2. Materials he's to use
   3. Procedures he's to follow
   4. Some form of self-checking device to be used prior to the post-test
   5. Time line indicating projected amount of time per packet/activity (secondary)

FIGURE 9
SUMMER CURRICULUM WORKSHOP

Personnel Data Sheet

NAME ______________________________ DATE ____________________

Workshop Responsibilities: Grade Level(s) ______________

Subject Area(s) ____________________________

____

EDUCATIONAL BACKGROUND:

Colleges/Universities Attended	Dates	Degrees	Major(s)/Minor(s)

If you are currently involved in a degree program, please answer the following:

Name of institution: ______________________________

Brief description of program:

EXPERIENCE BACKGROUND (Education and/or Related Areas)

Title/Position	Dates	Employer	Reference

RESEARCH/CURRICULUM BACKGROUND:

Please indicate any previous experience you've had in curriculum construction and/or educational research. Use the reverse side indicating the type of experience, sponsoring institution, and dates.

FIGURE 10
EDUCATION SEMINAR

TO: CONTINUOUS PROGRESS STAFF MEMBERS

FROM: Marilynn Wendt

RE: DR. BANTEL'S SEMINAR

If enough staff members are interested, Dr. Bantel will offer a seminar as a follow-up to our summer workshop. The course would carry graduate credit, transferrable to any university and applicable to any master's or doctoral program.

Dr. Bantel is willing to offer this seminar at our convenience. However, he did indicate that it should begin officially within the next week but could continue for as long as participants wished. That is, those people who wished to enroll for one trimester beginning at this time could do so and receive credit at the end of the term. Those wishing to continue for another trimester could also have this option and would receive a grade P (Progressing) at the end of the first term and a final grade when they concluded their work.

The requirements of the seminar would be determined by the participants in it.

Dr. Bantel was uncertain as to the exact costs at Oakland, but he felt that $28.00 per semester hour would be a pretty fair estimate. The seminar would carry 4 semester hours credit per term.

If I didn't goof too badly in getting his course descriptions, the possibilities are as follows:

1st term - Education 590 - 4 semester hours - Classroom Ecology
2nd term - Education 591 - 4 semester hours - Man and Environment: Ecological problems in education
3rd term - Ed. Psych. 592 - 4 semester hours - Ecological problems related to educational psychology

People who wish to audit may do so and those who would like to participate occasionally may do so PROVIDED the enrolled participants approve.

If you are interested, please fill out and detach the form below and return it to Marilynn Wendt, Way School, by Monday, January 19. (Dr. Bantel must have this information by Wednesday morning.)

EDUCATION SEMINAR - OAKLAND UNIVERSITY

Name ______________________________ School ____________________

I am interested in participating in the proposed seminar as checked below:

__________Course credit (graduate) _____Audit _____Unofficially on a part-time basis

I cannot meet ______________________(days) ________________(times)

1. Summer Curriculum Workshop,
2. Statements and Implications,
3. Basic Assumptions Concerning Curriculum Change,
4. Force-Field Analysis,
5. Task Analysis,
6. Secondary Task Analysis,
7. Instructional Guide.

Participants in the project received forms not only to guide their evaluation of students but also to evaluate their contributions to the research in measurable terms based on uniform criteria. They were given specifications for describing student performance in a directive entitled Evaluation -- Student Performance. Their results could then be tabulated on the form, Bloomfield Hills Continuous-Progress Curriculum Objective Evaluation Sheet in light of the criteria as described for assessment against the design. Further data reporting student progress were to be gathered for learners individually and collectively. Such forms are, by and large, self-explanatory; they relate time, achievement, and maturity (level of instruction) to the attainment of behavioral objectives. Their titles are indicative of their function:

1. Daily Progress Record (Activity),
2. Bloomfield Hills School District Daily Progress Record (Course),
3. Student Profile,
4. Course Evaluation Sheet,
5. 1968-1969 Course Evaluation, and
6. Objective Evaluation Sheet.

FIGURE 11

RETURN TO MARILYNN WENDT, WAY SCHOOL BY THURSDAY, APRIL 24

SUMMER WORKSHOP APPLICATION
CONTINUOUS PROGRESS CURRICULUM

Name ______________________________ Date ____________________

School ______________________________ Grade/Subject ____________________

GENERAL INFORMATION

Workshop Dates:	June 23 - August 1 (except July 4)
Hours:	8:00 a.m. - 12:00; 12:30 p.m. - 3:30 p.m.
Location:	Lahser High School
Salary	In accordance with the current Master Contract (see Article XXVII, p. 27)

The following tasks must be completed as part of the U.S.O.E. workshop proposal. All applicants must be capable of and willing to do each.

1. Assemble and classify system, discipline, terminal performance, interim performance, course, and basic skill objectives.
2. Cross-index all objectives to determine interrelationships between and among subject areas.
3. Inventory published resource materials and code them into the curriculum design.
4. Develop teacher packets according to given specifications.
5. Develop student materials to individualize the instructional program, capitalizing on student interests whenever possible.

Please check below to indicate your preferences:

______ Full-time (210 hours) ______ Part-time (105 hours or less)

If part-time, please indicate the dates, days, and/or hours you'd be available.

____

____

SUBJECT PREFERENCE

ELEMENTARY ____________________ SECONDARY ____________________

list subject(s) list subject(s)

FIGURE 12

RETURN TO MARILYNN WENDT, WAY SCHOOL, BY THURSDAY, MAY 23

SUMMER WORKSHOP APPLICATION
CONTINUOUS PROGRESS CURRICULUM

Name ______________________________ Date _______________

School ________________________ Grade/Subject _______________

The following tasks must be completed as part of the U.S.O.E. workshop proposal. Some are highly specialized and will require only limited participation while others will necessitate involvement of nearly all participants. Please check ALL areas where you feel you could make a significant contribution.

General

____ Assemble and classify all objectives (system, TPO, IPO, etc.).

____ Construct the research design to evaluate the total continuous progress curriculum.

____ Cross-index all objectives to determine interrelationships between and among subject areas.

____ Inventory published resource materials and code them in to the curriculum design.

____ Test the reliability and validity of course prerequisites.

____ Revise behavioral objectives based on evaluation recommendations.

____ Reorder the objectives where necessary (determined by eval.).

____ Reorganize behavioral hierarchies based on cross-indexing recommendations.

Elementary

____ Art
____ Communication Skills
____ Mathematics
____ Music
____ Physical Education
____ Science
____ Social Studies
____ Other (specify)

Secondary

____ Art
____ Behavioral Sciences
____ Business Education
____ Foreign Language
____ Home Economics
____ Humanities
____ Ind. Educ.
____ Mathematics

____ Music
____ P.E.
____ Science
____ Other (specify)

FIGURE 13
SUMMER CURRICULUM WORKSHOP

DISCUSSION GROUP SCHEDULE

NOTE: The same groups meet on Days A and C and on Days B and D.

	DAY A		DAY B
8:00-8:30	Group Critiques	8:00-8:30	Group Critiques
8:30-9:30	Elementary Primary	8:30-9:30	Junior High Humanities
10:00-11:00	Elementary Intermediate	10:00-11:00	Secondary - Other* (AM group)
12:30-1:30	Secondary Science	12:30-1:30	Senior High Humanities
2:00-3:00	Secondary Mathematics	2:00-3:00	Secondary - Other* (PM group)
3:00-3:30	Group Critiques	3:00-3:30	Group Critiques

	DAY C		DAY D
8:00-8:30	Group Critiques	8:00-8:30	Group Critiques
8:30-9:30	Secondary Science	8:30-9:30	Senior High Humanities
10:00-11:00	Secondary Mathematics	10:00-11:00	Secondary - Other* (AM group)
12:30-1:30	Elementary Primary	12:30-1:30	Junior High Humanities
2:00-3:00	Elementary Intermediate	2:00-3:00	Secondary - Other* (PM group)
3:00-3:30	Group Critiques	3:00-3:30	Group Critiques

*Secondary - other: Includes Industrial Education, Home Economics, Foreign Language, Music, Art, Business Education, and Physical Education.

FIGURE 14
SUMMER CURRICULUM WORKSHOP

WEEKLY SCHEDULE

Robert Boston A.M. - Lahser - M-T-W-Th-F
P. M. - Lahser - M-T-Th-F; EHJH - W
*Available at EHJH or Way at any time upon request

Marilynn Wendt A.M. - Lahser - M-T-W-Th-F
P. M. - EHJH - M-W-F; Way - T-Th

SUBJECT AREA/GROUP MEETINGS

	Monday	Tuesday	Wednesday	Thursday	Friday
A.M.		Lahser 8:00-Human. 8:45-Math. 9:30-Science	Lahser 8:00-Music 8:45-Ind.Ed. 9:30-P.E.	Lahser 8:00-Beh.Sci. 8:45-Speech 10:00-For.Lang.	
P.M.		Way 1:00-Prim. Lang.Arts 1:30-Inter. Lang.Arts 2:00-Prim.Math 2:30-Intermed. Math	EHJH 12:30-Art 1:15-Human. 2:00-Science	Way 1:00-Science 1:30-Soc. Studies 2:00-Elem. Coord.	TIME SHEETS DUE

Please submit materials to be critiqued as designated below:
Elem. - as completed
Secondary - see schedule below

Monday	Tuesday	Wednesday	Thursday	Friday
Science Music	Ind.Educ. P.E. Art	Speech/Dr. For.Lang Beh.Science	Business	Humanities Mathematics

FIGURE 15

CURRICULUM WORKSHOP RESPONSIBILITIES-SECONDARY

1. Review the Discipline Objectives for your subject area(s).
2. Revise/reorganize/develop TPO's in light of Discipline Objectives.
3. Revise/develop IPO's, if necessary, to fit TPO's.
4. Evaluate each IPO/TPO in terms of: (Complete this after analyzing individual student progress charts from the 1968-69 school year.).
   a. Minimum performance standards (how realistic?).
   b. Time limits defined for each objective (Are these realistic for students who work at a "normal" rate? Can the objectives be completed in light of 60% of the class time being devoted to their attainment?).
   c. Clarity of specifications.
   d. Prerequisite skills necessary.
5. Organize the IPO's/TPO's into course objectives so that they reflect a logical teaching sequence. Define the number of objectives the student must complete to receive 1/2 credit.
6. Inventory available resource materials and code them to the course objectives for which they are most appropriate.
7. Develop/revise teacher packets according to given specifications.
8. Develop/revise student materials so that they:
   a. Meet the educational implications of the continuous progress philosophy.
   b. Include a rationale for including the activity within the course (How does the activity fit into the overall course?).
   c. Describe the objective(s) to be fulfilled (in student language).
   d. Reflect a wide variety of method/media options, including the option for students to suggest methods/materials to accomplish the objective(s) so that their interests may be capitalized upon.
9. Tests or evaluation criteria:
   a. Pretests
      (1) Pretests, including alternate forms, should be developed for each IPO or series of IPO's.
      (2) Sufficient items should be included to determine whether or not a student should be allowed to omit a given objective.
   b. Post-tests (Evaluations)
      (1) Evaluations should be developed for each course objective, including alternate forms.
      (2) Cumulative evaluations should be developed to check a student's progress in relation to a series of course objectives.
      (3) Major evaluations should be developed to evaluate the student's progress over each half of the course. (These are to be administered when students reach the half-way or endpoint in the course--NOT on a specified calendar date.)

DIRECTIONS FOR COMPLETING WORK PLAN

After your group has reached consensus on the specific tasks it needs to complete, and after you have received your set of responsibilities, break these down into detailed tasks you will be trying to accomplish throughout the workshop. Arrange these on a priority basis and then organize them on a weekly schedule on your tentative work plan. It is understood that some flexibility must be maintained when unforeseen obstacles appear. Complete 2 copies of the work plan. Keep one as your guide and submit the other to Marilynn Wendt, Project Director. This latter copy will be used by administrators, coordinators, and consultants to provide you with the maximum amount of help possible.

FIGURE 16
SUMMER CURRICULUM WORKSHOP

TENTATIVE WORK PLAN

Name:__________________ SUBJECT:________________________

WEEK 1

WEEK 2

WEEK 3

WEEK 4

WEEK 5

WEEK 6

FIGURE 17
CRITERIA FOR OBJECTIVES

Name:
Date:
Content covered:

Objectives	à la mager - 4 part	clarity	sequence	uniform design	eliminated	materials (commercial)	materials (developed)	relationship to discipline	prerequisite	time factor	minimum performance	replacement (entirely new)	new

I. Progress chart
  A. Student
  B. Class
  C. Parent
II. Material organization
III. Recommendation for additional materials

FIGURE 18
BLOOMFIELD HILLS CONTINUOUS PROGRESS CURRICULUM

OBJECTIVE EVALUATION SHEET

Name of Consultant________________________Organization/Agency__________

Course/Subject Area________________________Date ____________________

	RECOMMENDED REVISIONS BASED ON:						RECOMMENDED ADDITIONS:					
Objective No.	à la Mager–4 prts.	clarity	unrealistic minimum standards	unrealistic time factor	Objective should be eliminated.	sequence should be changed	commercial materials	teacher–developed materials	learning strategies	pre–tests	post–tests	identify pre–requisites

Please check the appropriate space to indicate your response to each of the following:

	Yes	No	Undetermined
1. Are course objectives adequate to justify course credit?	_____	_____	_____
2. Are the objectives and accompanying materials transmissible to professionally trained personnel in the subject area field?	_____	_____	_____
3. Are the objectives of a sound educational quality to be accepted by the professional subject area groups?	_____	_____	_____

Please list general comments or recommendations for future curriculum efforts on the reverse side and indicate whether or not you'd be willing to serve as a consultant again on some future date. Thank you for your cooperation.

FIGURE 19
SPECIAL EQUIPMENT/TEXTBOOK MATERIALS/SUPPLIES

If there are any special materials, equipment, or supplies that you'll need this summer, please itemize them below and check whether you'll bring them with you or whether you'd like them picked up and delivered to Lahser during the week of June 16-20

Item	Check One		LOCATION (if materials are to be picked up)
	Bring	Pick Up	

Name ______________________ School ______________

NOTE: PLEASE BRING ALL PRESENT CONTINUOUS PROGRESS CURRICULUM GUIDES AND OBJECTIVES (DISCIPLINE, COURSE, BASIC SKILLS, ETC.) WITH YOU ON JUNE 23.

FIGURE 20

It has been suggested that a uniform DAILY PROGRESS RECORD be developed for secondary students. This record would be kept by the student to reflect his progress in relation to course time lines. Check the following format to see if it would be workable for your subject area. Suggest any modifications you feel necessary for Marilynn Wendt or Robert Boston by Friday, July 26.

Name ________________________
Subject ________________________

DAILY PROGRESS RECORD

Instructional Day	Calendar Date	ACTIVITY (Packet, Worksheet, Evaluation, etc.)	Score	Assignment	Remarks
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

FIGURE 21

BLOOMFIELD HILLS SCHOOL DISTRICT
DAILY PROGRESS RECORD

COURSE____________INSTRUCTOR________NAME________ ____________

WEEK	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	CO	DAYS	GRADE
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								

FIGURE 22

COURSE SUMMARY SHEET

COURSE______________INSTRUCTOR_______________NAME_______________
GRADE LEVEL_____ SCHOOL YEAR _____NO. OF OBJ.___FINAL GRADE___
DATE BEGAN ____________ DATE COMPLETED ______________________

QTR. COMP.* CO	1	2	3	4	5	6	7	8	9	10
EST. DAYS CLASS DAYS										
GRADE										
OUTSIDE TIME*										

Q	EO	CO	GRADE

QTR. COMP.* CO	11	12	13	14	15	16	17	18	19	20
EST. DAYS CLASS DAYS										
GRADE										
OUTSIDE TIME*										

Q	EO	CO	GRADE

QTR. COMP.* CO	21	22	23	24	25	26	27	28	29	30
EST. DAYS CLASS DAYS										
GRADE										
OUTSIDE TIME*										

Q	EO	CO	GRADE

QTR. COMP.* CO	31	32	33	34	35	36	37	38	39	40
EST. DAYS CLASS DAYS										
GRADE										
OUTSIDE TIME*										

Q	EO	CO	GRADE

*Optional

FIGURE 23
COURSE EVALUATION SHEET

COURSE TITLE ______________________________

NO. OF OBJECTIVES ______________________________

NO. OF COURSE OBJECTIVES PER COGNITIVE PROCESS

__________ 1.0 - Interpreting

__________ 2.0 - Classifying

__________ 3.0 - Hypothesizing/Predicting

__________ 4.0 - Experimenting

__________ 5.0 - Constructing a Model

NO. OF COURSE OBJECTIVES PER DISCIPLINE OBJECTIVE CLASSIFICATION

(ex MDO - (A) or MDO - (B) or MDO - (C))

__________ Course Objective For __________ DO

__________ Course Objective For __________ DO

__________ Course Objective For __________ DO

__________ Course Objective For __________ DO

FIGURE 24
EVALUATION -- STUDENT PERFORMANCE

The criteria for student evaluation is established in the behavioral objective. This includes how, what, and with what degree of accuracy the student will demonstrate desirable skills. The method of evaluation used may be stipulated in the objective if it involves a skill which does not lend itself to a variety of ways of demonstrating; but, it may also be an individual teacher, student, or teacher-student decision.

Specifications for Student Performance. The design for curriculum construction includes System Objectives, Discipline Objectives, Terminal Performance Objectives, Interim Performance Objectives, and Course Objectives. Where are the specifications given?

System Objective:	This is a statement defining inquiry and communication as the skills of learning how to learn. There is no specification for student performance given.
Discipline Objective:	These objectives define processes through which a learner develops inquiry and communication skills and broad content areas representative of the discipline. The standard statement is "with accuracy equal to or greater than the predetermined minimum level."
Terminal Performance Objective:	This objective reflects discipline objectives. It states the specific skills and content which the student must be able to perform at the completion of the learning experience. Certain characteristics of the discipline for which the objective is written determine the amount of content written into this terminal objective and consequently, whether or not a percentage value or other performance specifications are attached. If the terminal performance objective is peculiar to only one task or lends itself to only stated content, then specification for evaluation is required. However, if the content and the specifications for evaluation can be altered to fit the interests or other characteristics of students, then the specifications for evaluation must be open-ended to allow for this versatility.
Interim Performance Objective:	The interim performance objectives represent a series of steps through which a student would progress toward the attainment of the terminal performance objective. Like the terminal performance objective, the interim performance objective may be only a general outline of the content or it may be very specific dependent upon the discipline content and/or the skill within the discipline.

Interim Performance Objective: (Cont.)	Basically, the interim performance objective states the minimum degree of accuracy acceptable for completion of the objective.
Course Objectives:	Course objectives combine various interim and terminal performance objectives and organize them into a series of sequential learning experiences. Each course objective defines the minimum degree of accuracy acceptable for completion of the objective. Course credit is issued when the student successfully completes all course objectives for that course.
Methods of Evaluation.	Specifications for measuring behavior changes may take a variety of forms. The evaluation may be a pencil and paper test, oral test, or a demonstration appropriate to the content and skill. Regardless of the method of evaluation, the objective must define a skill and the criteria for measuring the skill must be consistent with the objective. The cognitive responses to stimuli involving either the psychomotor or affective domain become the basis for evaluation. The portion of a response may involve creativity, an attitude, value, or appreciation. This is not directly evaluated; however, the evaluation is made on the established cognitive criteria. Creativity, for example, cannot and should not be evaluated--only nourished through opportunity and guidance.

FIGURE 25

STUDENT PROFILE

Name ____________________

Subject ____________________

Maturity Code

A - Needs much teacher supervision
B - Needs teacher supervision about 50% of the time
C - Needs teacher supervision 25% of the time or less

Teacher ________ Year ________ 7th Grade	Teacher ________ Year ________ 8th Grade

COMMUNICATION SKILLS		1 2 3	1 2 3	1 2 3	1 2 3
Oral	02.0 -	— — —	— — —	— — —	— — —
	03.0 - Formal discussion (seminar)	— — —	— — —	— — —	— — —
	04.0 - Extemporaneous speech	— — —	— — —	— — —	— — —
	05.0 - Expository speech	— — —	— — —	— — —	— — —
Writing	W1.0 - 700 word essay	— — —	— — —	— — —	— — —
	W1.30 - Theme	— — —	— — —	— — —	— — —
	W1.31 - Outline	— — —	— — —	— — —	— — —
	W1.32 - Outline and report	— — —	— — —	— — —	— — —
Research Location	RL3.0 - Thesaurus	— — —	— — —	— — —	— — —
	RL4.0, 4.5 - CardCatalog	— — —	— — —	— — —	— — —
	RL7.0 - Reader's Guide	— — —	— — —	— — —	— — —
	RL8.0 - Reference Tools	— — —	— — —	— — —	— — —
	RL9.0 -Current Topic Reference Tools	— — —	— — —	— — —	— — —
Listening Skills	LS1.0 - Courtesy	— — —	— — —	— — —	— — —
	LS2.0 - Follow directions	— — —	— — —	— — —	— — —
	LS4.0 - Main and subordinate ideas (Note-taking)	— — —	— — —	— — —	— — —
Reading Skills	R1.13 - Figures of speech	— — —	— — —	— — —	— — —
	R1.14 - Word of origin	— — —	— — —	— — —	— — —
	R1.0, 3.0 - Main and subordinate ideas	— — —	— — —	— — —	— — —
	R4.0, 5.0, 8.0, 9.0 R10.0, 11.0, 12.0, R13.0 - Perceiving relationships	— — —	— — —	— — —	— — —

STUDENT PROFILE (Cont.)	1 2 3	1 2 3	1 2 3	1 2 3
R17.0 - Author's purpose	___	___	___	___
R18.0 - Plot structure	___	___	___	___
R20.0 - Propaganda	___	___	___	___

MATURITY

Consider the following factors and rate the student's overall maturity:

1. Accepts responsibility for completing work
2. Works beyond basic requirements
3. Indicates responsibility in carrying out his role as a student (participates in group discussions without direct teacher supervision, demonstrates ability to work well in other areas of the building, such as the library or a lab, when his work requires this)
4. Adequate attention and interest span; concentration

7th	____ A	____ A	____ A	____ A
	____ B	____ B	____ B	____ B
	____ C	____ C	____ C	____ C

FIGURE 26
CONSULTANT INVENTORY

Would you please complete the following form and return it to:

Miss Marilynn Wendt
Director of Curriculum
2800 Kensington Road
Bloomfield Hills, Michigan 48013

Your Name ____________________

Title ____________________

Business Address ____________________ Phone __________

Home Address ____________________ Phone __________

Background studies and experience

What education, degrees, and certification do you have to qualify you for your role: (1) to measure the worth of behavioral objectives, (2) to assess performance, (3) to evaluate sequence, test instruments, and learning strategies, and (4) to identify how instruction is implemented through the implementation of performance criteria in a student-oriented curriculum?

____

____

____

____

What experience do you have which qualifies you for a consultant's role critiquing behavioral objectives?

____

____

____

____

Outline your predicted contributions to the project which will appear in the final report.

____

____

____

How would you describe their value to an administrator or curriculum specialist who would like to plan a program for individualizing instruction?

____

____

____

To what extent will your contributions fit the overall objective of the project, to provide the information, stimuli, and support for developing, evaluating, and revising behavioral objectives to serve as a model for individualizing instruction in secondary schools?

____

____

____

Logistics

How would you like to schedule your allotted time?

____

____

Where would you like to spend your time?

____

What materials will you need?

____

What equipment will you use?

____

FIGURE 27
AGREEMENT FOR PROVIDING CONSULTANT SERVICES

Return to: ______________________

By: ______________________

Project: ______________________

Date(s): ______________________

Sponsor(s): ______________________

Conditions: The sponsor and consultant are willing to honor the terms of this agreement. If conditions arise such that either or both parties do not fulfill or complete their responsibilities, this agreement is no longer in effect and its terms are no longer binding on either party, the sponsor or the consultant. The consultant is not eligible for payment for services rendered until such a time when all required duties have been discharged.

Name of Consultant: ______________________

Title: ______________________

Address: ______________________

____

Responsibilities of
Consultant
Description of Services: ______________________

____

____

Accounts of Services, i.e., Reports, Data Collection, Curriculum Construction, and Research Instruments, Analyses, etc.

____

____

Consulting Date(s): ______________________

Consulting Fees: ______________ ______________
Date Amount

AGREEMENT FOR PROVIDING CONSULTANT SERVICES (Cont'd.)

Expense Allowances
Travel Costs: ______________________________
Means of Travel
Date(s) ______________ Amount ______________

Per Diem Costs ______________ ______________
Room per Day Food Service per Day

Room Date(s) ______________ Amount ______________

Food Service Date(s) ______________ Amount ______________

Arrangements for
Working in the
Project: ______________________________

____

____

____

____

Date __________ Signature of Consultant ______________

Date __________ Signature of Sponsor ______________

Return Address: ______________________________

____

____

Telephone Number: ______________________________

FIGURE 28
STATEMENTS AND IMPLICATIONS

STATEMENT 1:

THE LEARNER MUST HAVE AN ADEQUATE CONCEPT OF SELF IF HE IS TO SUCCEED: WITHOUT IT HE CANNOT EVEN TRY.

IMPLICATIONS:

STATEMENT 2:

BEHAVIOR RESULTS FROM UNIQUE INDIVIDUAL PERCEPTION. BEHAVIOR IS THE RESPONSE OF AN ORGANISM TO NEW PROBLEM-SITUATIONS. PERCEPTIONS DEVELOP OUT OF THE INDIVIDUAL EXPERIENCES OF THE ORGANISM, AND HENCE ARE UNIQUE TO HIM.

IMPLICATIONS:

STATEMENT 3:

EACH INDIVIDUAL IS UNIQUE, AND HE PERCEIVES IN TERMS OF HIS EXPERIENTIAL BACKGROUND AND PRESENT PURPOSES.

IMPLICATIONS:

STATEMENT 4:

EACH LEARNER IS UNIQUE: DIFFERENCES BETWEEN LEARNERS TEND TO INCREASE WITH EFFECTIVE LEARNING. INDIVIDUAL DIFFERENCES ARE NATURAL, NORMAL, AND IMPOSSIBLE TO ELIMINATE.

IMPLICATIONS:

STATEMENT 5:

THE PUPIL LEARNS AS A TOTAL ORGANISM HE CANNOT DIVIDE HIMSELF INTO SEPARATE SUBJECT DISCIPLINES AS THE SCHOOL IS OFTEN DIVIDED.

IMPLICATIONS:

STATEMENT 6:

SUBJECT MATTER SHOULD EVOLVE FROM MEANINGFUL PROBLEM-SOLVING ACTIVITIES RATHER THAN FROM FRAGMENTS OR PARCELS OF SUBJECT AREA DISCIPLINES.

IMPLICATIONS:

STATEMENT 7:

SUBJECT MATTER IS BEST UTILIZED WHEN THE LEARNER PERCEIVES IT AS FUNCTIONAL TO THE SOLVING OF PROBLEMS HE HAS FORMULATED.

IMPLICATIONS:

STATEMENT 8:

CONCEPT DEVELOPMENT PROCEEDS FROM THE CONCRETE AND THE ABSOLUTE TO THE MORE ABSTRACT AND MORE RELATIVE.

IMPLICATIONS:

STATEMENT 9:

LEARNING IS ESSENTIALLY A PROCESS OF PROBLEM-SOLVING AT PROGRESSIVELY HIGHER LEVELS. KNOWLEDGE OF FACTS IS A MEANS TO THIS PURPOSE OF SOLVING PROBLEMS: IT CANNOT BE JUSTIFIED AS AN END IN ITSELF.

IMPLICATIONS:

STATEMENT 10:

EACH CHILD SHOULD BE MORE CONCERNED WITH THE PROCESS OF SOLVING PROBLEMS THAN WITH FINDING THE RIGHT ANSWER TO THE PROBLEM.

IMPLICATIONS:

STATEMENT 11:

STUDENTS CANNOT ASSUME RESPONSIBILITY IN LEARNING UNLESS THEY CAN SEE A PURPOSE FOR THE LEARNING.

IMPLICATIONS:

STATEMENT 12:

TEACHERS WHO IGNORE THE PURPOSES OF THE LEARNER ARE DESTROYING MOTIVATION.

IMPLICATIONS:

STATEMENT 13:

CREATIVE AND PRODUCTIVE LEARNING EXPERIENCES INVOLVE SELF-EVALUATION.

IMPLICATIONS:

STATEMENT 14:

ALL THE VARIOUS FORMS OF "HOMOGENEOUS" GROUPING EVER USED HAVE DEMONSTRATED (1) THAT CHILDREN DO NOT LEARN MORE IN SUCH GROUPS AND (2) THAT THE RANGE OF LEARNING DIFFERENCES WITHIN THE GROUP IS NOT REDUCED BY A SIGNIFICANT EXTENT.

IMPLICATIONS:

STATEMENT 15:

THE USE OF RIGID GRADE LEVEL STANDARDS IS INVALID, INEFFECTIVE, AND A DETERRENT TO LEARNING.

IMPLICATIONS:

FIGURE 29
FORCE-FIELD ANALYSIS

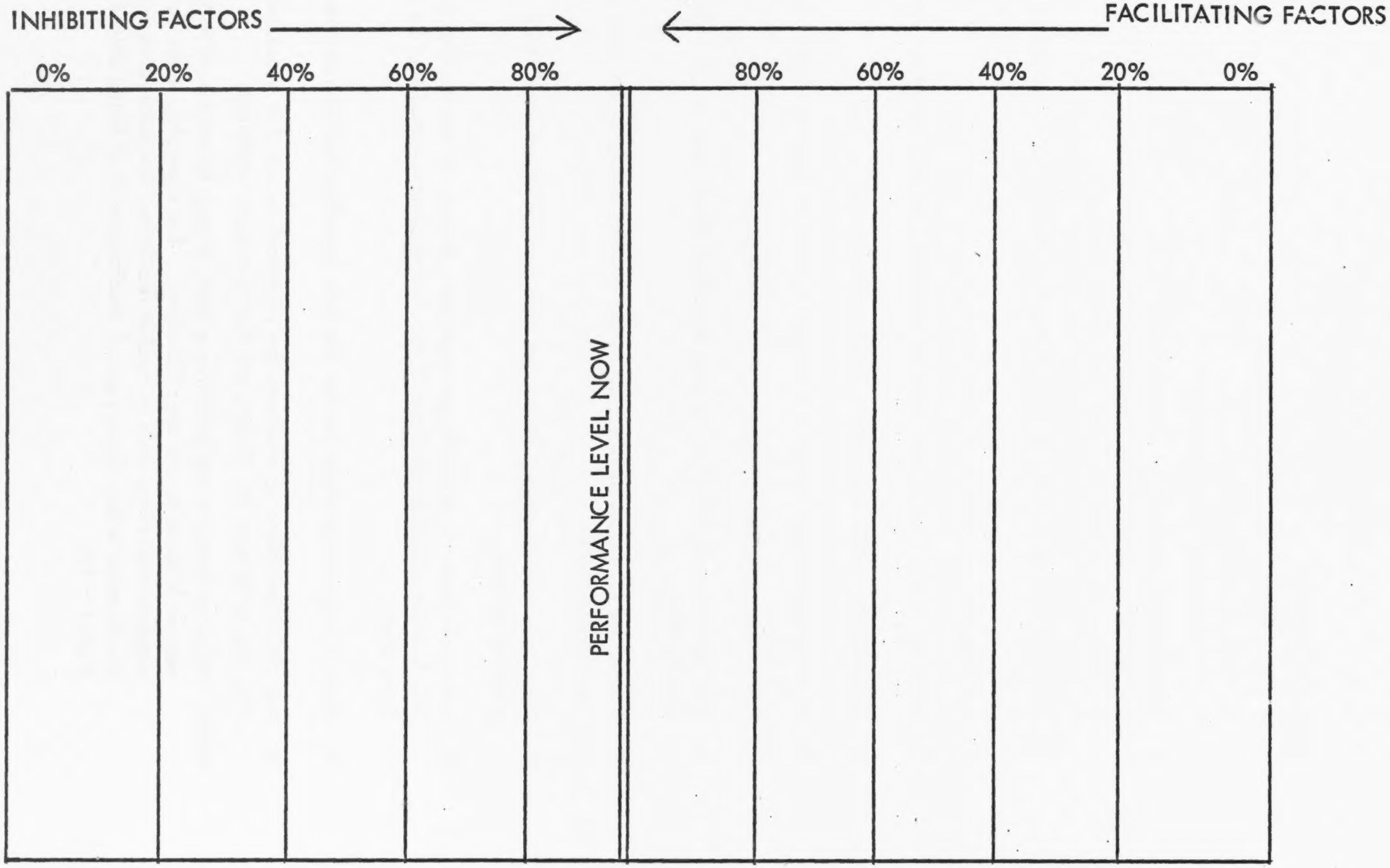

FIGURE 30
TASK ANALYSIS

General Outline

1. General background of interviewee
   a. Amount of experience
   b. Area of specialization, etc.
2. Interviewee's philosophy of education
   a. How does he perceive the role of the student?
   b. How does he perceive the role of the teacher?
3. Ask interviewee to describe something that he considers worthwhile for students to do.
4. Ask interviewee if students like this task.
5. What do students do to demonstrate successful attainment of the task?
6. Are students tested to measure their performance?
7. Does a student have to get a minimum number of items correct?
8. Will he need to use this task again in the future?
9. Can you describe all of the things a student would have to do to accomplish this task?
10. Do the items described in (9) go in any special order, or are any of them taught together?
11. After interviewee groups items, ask him how he determined the order or grouping pattern.
12. Ask interviewee to describe prerequisites, if any, to accomplish the task. Ask how he would teach these if the student demonstrated that he did not have them.
13. Write a behavioral objective for the task described by the interviewee.
14. Ask the interviewee to evaluate the statement to see if it accurately describes the task as he sees it. If not, ask him to suggest revisions.

NOTE: When an interviewee describes a task, it may be necessary to have him narrow it down to one specific aspect. For example, if the interviewee suggests something such as number readiness, the interviewer may ask him to name a specific aspect of readiness such as being able to count from 1 - 10.

SECONDARY TASK ANALYSIS

QUESTION:	ANSWER:
1. Describe for me something you feel that is worthwhile for your students to study in Biology One.	1. I would like them to study cell structure.
2. Do students like this?	2. Yes, this is the first time that they used the microscope.
3. What do you mean by study?	3. I would want them to examine a variety of representative cells, name and describe major structures and functions of the cell.
4. Would you name for me an example of a particular cell whose structure you'd like to study?	4. The student could easily prepare onion epidermis for microscopic examination and easily observe major structure of the epidermis which are characteristic of the plant cells.
5. I'm not sure that I understand. What do you mean by major structures of plant cells?	5. By observing plant tissues under a microscope, students would see that the tissue is divided into units called cells. He could see that the cell bounded by a cell wall consist of a nucleus and cytoplasm. He should also be able to observe the nucleolus, vacuoles, stored food materials and possible mitochondria.
6. How would you determine that a student had observed these major structures which you just named for me?	6. There could be several ways: 1) We could use a microscope or a projector and name the structure.

SECONDARY TASK ANALYSIS (Cont.)

QUESTION:	ANSWER:
	2) A student could be given a diagram and name the parts. 3) A student could submit a diagram, one that he constructs and labels for his observations with the microscope.
7. Would a student have to be able to label each of the major structures you named correctly?	7. You mean all students?
8. Yes.	8. No.
9. What would be the least you'd accept?	9. Those which are clearly visible through his own microscopic examination. Other students might name things which aren't visible with our microscopes, but can be seen with an electronic microscope.
10. Which ones would be clearly visible?	10. Nucleus, nucleolus, vacuoles, chloroplast, cell membrane and cell wall.
11. Will he need to use these structures again?	11. Yes.
12. Is there anything that you would expect the student to know how to do before he starts to study cell structure?	12. Yes.
13. Would you name these for me?	13. How to use the microscope How to make a water mount slide preparation. Simple technique of staining tissues, and how to use certain dissecting instruments.

QUESTION:	ANSWER:
14. Like what?	14. Oh - Forceps, scissors, scalpel. I guess that's it.

Questioner writes:

Using a microscope and student prepared slides of specified tissue types, the learner will identify and name the basic parts of the cell structure, (i.e.,nucleus, nucleolus, chloroplast, cell membrane, and cell wall) 100% accuracy in a period of 3 days.

FIGURE 31
INSTRUCTIONAL GUIDE

TPO ______________________

SUGGESTED METHOD	SUGGESTED MATERIAL

TPO ______________________________

IPO # ________________

Prerequisite (s)

CONTENT	EVALUATION

FIGURE 32
SUMMER CURRICULUM WORKSHOP - PAY REPORT

This form is to be turned in on the last day of each pay period.

In each box record the number of hours worked.

Name ____________________
Hourly Rate ____________________

		June 23	24	25	26	27	30	July 1	2*		
1st Pay Period	AM										
	PM										

Total hours this pay period ________

		July 3	4	7	8	9	10	11	14	15	16*
2nd Pay Period	AM										
	PM										

Total hours this pay period ________

		July 17	18	21	22	23	24	25	28	29	30*
3rd Pay Period	AM										
	PM										

Total hours this pay period ________

		July 31	1**	4	5	6	7	8	11	12	13
4th Pay Period	AM										
	PM										

Total hours this pay period ________

	Date (Please list)										
Pay Period	AM										
	PM										

Total hours this pay period ________

*Turn in time sheet **Regular workshop ends

FIGURE 33
BLOOMFIELD HILLS SCHOOL DISTRICT

HOURLY EMPLOYEES - PAY REPORT - 1967-68

Name ______________________________ Building ______________________

Week beginning ____________________, 1968 Ending _______________, 1968

Hourly Rate _____________

DAY	DATE	HOURS Morning	 Afternoon
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			

TOTAL HOURS ____________

These reports must be turned in on the last scheduled work day of each week.

PERSONNEL

Responsibilities for Program Appointments

Project Director:-- The Project Director was to organize an in-service program to function for developing project procedures. This program would operate through two study groups in order to achieve the overall objectives.

The roster of participants was to be filled by the Project Director. They would be selected after careful testing and screening to determine the proficiencies of the applicants, as well as their qualifications for and personal interest in curriculum research.

Study Groups:--

In keeping with the original budget figures, the larger of the two groups were to be made up of approximately 60 staff members, visiting consultants, and 11 system coordinators. They would have the responsibility of gathering, examining, and furnishing data as well as executing the administrative directives for reaching the indicated goals. In addition, a very carefully selected smaller group was to plan the program, delegate the various tasks, act as liaison among the various persons involved in the project, and provide feedback for evaluating the research patterns. These in-service study groups were to meet at convenient times during the week, including Saturdays, for workshops. Although the work sessions might fall naturally into conferences involving subject - area subgroups or total involvement, either kind would meet for all of its sessions in one of the continuous-progress schools.

Leadership duties were to be shared by certain Bloomfield Hills administrators under the direction of Robert E. Boston, Assistant Superintendent for Curriculum and Local Coordinator for the ES '70 Project of the U. S. O. E. Marilynn Wendt, Director of Research, was to handle the administrative duties as Project Director. The director would coordinate the project and advise Mr. Boston with regard to the progress, successes, failures and needs of the program as the project develops. Dr. Marjory E. Jacobson, Coordinator for Federal Programs, was to include among her duties all preparation and expedition of federal reports, control of expenditures in keeping with the provisions of the budget, and construction of task analysis to coordinate activities and identify task completion among the various groups or individuals responsible.

The Consultants:-- Consultants were expected to visit Bloomfield Hills a minimum of four times or the equivalent of four days for rendering consultant services. During the first visit they would give directions including the construction of a design catagorizing the specifics for what has to be done and for the time units which apply. During the second visit they were to study the progress shown to date. From these generalities the specialists would make pertinent recommendation to establish the next series of task blocks in order to identify the particularities of the individual assignments. Collectively, the experts will be stating specifically the definite procedures to be undertaken and completed during the second time segment. The third time around the consultants were to be expected to evaluate the program to date and, personally, to pick up the lag in case any components along the critical path might endanger the success of the system due to a delay in one or more areas of operation. The fourth visit was to conclude the workshops for developing the curriculum model of behavioral objectives. At this time, the consultants would write a final report stating their goals, describing the activities under this tutelage, identifying the success of their efforts, and making recommendations for further study in relation to the extent to which the goals have been reached.

The System Coordinators: -- System Coordinators, on the other hand, were to make up "on-line" personnel. They would assume responsibility for accomplishing the directives proposed by the Project Director. These duties would include the following:

1. To give out specifice tasks among members of the groups.
2. To coordinate the program activities in developing the program between the study groups and the administrative staff, outside agencies, and groups involved in cross-indexing.
3. To coordinate the tasks of inter- and intra- group personnel.
4. To share responsibility for the successful functioning of the study groups.
5. To act as resource persons for the study groups.
6. To know what is available for facilitating efficient procedures.
7. To contribute toward the plan for developing and writing the design of the study.

Clerical personnel: -- Two persons or their equivalant would be required in the technical and stenographic areas to accommodate the production of materials and handle necessary correspondence and clerical assignments. At least one of these persons should be a machine operator for duplicating materials in quantity. The other person, primarily, would need only clerical skills; however, it would be very helpful for this person to possess the additional training to perform secretarial duties.

Persons selected to carry out research activities: -- None of the professional persons was to serve within the scope of this project full-time, althougn most of them would be a part of the continuous-progress team. Their salaries would be comparable to and competetive with salaries of other positions in the area requiring similar responsibilities, if such positions exist.

Table 1 describes the minimum acceptable qualifications and duties for staff appointments.

TABLE 1

MINIMUM QUALIFICATIONS ACCEPTABLE FOR RESEARCH PERSONNEL

Position	Educational Background	Teaching Experience	Duties	Estimated Percent of Full-Time
Project Director	MA Degree minimum	3 years	Responsible for success of program, plan, implement, and evaluate program, Supervise personnel Coordinate project with continuous-progress curriculum program	25%
Coordinator for Reports	MA Degree minimum	3 years	Liaison officer with officials at the Nat'l and State levels, responsible for writing and transmitting all project reports to the proper agencies, responsible for compiling and transmitting all required financial statements to the proper agencies	25%
System Coordinators	MA Degree minimum Specialization in area of responsibility	3 years	Responsible to the Assistant Superintendent for Curriculum, responsible for assisting the Project Director, responsible for "on-line" production of materials of revised behavioral objectives	20%
Consultants	MA Degree minimum PhD preferable	3 years or its equivalent	Responsible to the Project Director, responsible for identifying and developing	

	Recognized authority in area of specialization		programs for curriculum innovation, show responsibility for success of this research study
Teachers	BA degree minimum MA preferable Teaching-certification requirement complete	Previous teaching experience not mandatory but desirable	Commitment of philosophy to "individualized" instruction, knowledgeable with regard to the philosophy, terminology, and operation of the Bloomfield Hills continuous-progress curriculum

Table 2 gives a brief description of the qualifications and experience of those engaged in carrying out the research and development necessary to achieve the specifications of the objectives.

TABLE 2

DIRECTORY OF PERSONNEL FOR STAFF UTILIZATION AND CLERICAL SERVICES

Area of Research	NAME	Title/Position	Education	Experience
Foreign Language	Abraham, Marcia	Teacher	M.A.	Teaching
Science	Balmer, Jan	Teacher	A.B.	Teaching
Humanities	Barnes, Frances	Teacher	M.A.	Teaching
	Berman, Leslie	Teacher	A.B. - Candidate for Master's	Teaching
Mathematics	Betts, Mary Ann	Teacher	B.S.	Teaching
Science	Bloetscher, Loren	Teacher	A.B.	Teaching
Humanities	Bohr, Cynthia	Teacher	A.B.	Teaching
Humanities	Bruner, Chris	Teacher	A.B.	Teaching
Science	Buday, Eugene J.	Teacher	A.B. - Candidate for Master's	Teaching
Science	Byers, Patricia	Teacher	A.B.	Teaching
Science	Campana, David	Teacher	M.A.	Teaching

Area of Research	Name	Title/Position	Education	Experience
Humanities and Music	Campbell, Douglass	Music Coordinator and Teacher	B.S. Master of Music	Supervision and Teaching
Communication Skills	Clark, Gordon	Teacher	A.B., M.A. Candidate for Specialists'	Teaching
Physical Education	Coatta, David			
Mathematics	Dickens, David	Teacher	A.B. Candidate for Master's	Teaching
Mathematics	Dobosenski, Michael	Teacher	A.B. Candidate for Master's	Teaching
Industrial Arts Education	Douma, Harold	Teacher	M.A., B.S.	Industry and Teaching
Communication Skills	Dunlap, Dorothy	Librarian	M.A.	Teaching and Administration
Humanities	Eby, Beverly	Teacher	A.B., M.A.	Teaching
Humanities	Ellenbaum, Charles	Teacher	M.A.	Teaching
Science	Emmer, Rita	Teacher	A.B.	Teaching
Mathematics	Engel, Jose	Teacher	A.B., M.A.	Teaching, Guidance and Counselling

Area of Research	Name	Title/Position	Education	Experience
Humanities	Erkfitz, Elsie	System Coordinator	M.A.	Supervision and Teaching
Humanities	Etter, Susan B.	(Contracted Services)	A.B.	Teaching
Science and Mathematics	Fraser, Donald	Teacher	M.A.	Teaching
Mathematics	Fraser, Pamela	Teacher	M.A.	Teaching
Humanities	Fulton, Barbara	Teacher	A.B., M.A.	Supervision and Teaching
Foreign Language	Garabrant, Wesa	Teacher	M.A.	Teaching
Humanities	Garratt, Linda	Teacher	A.B.	Teaching
Humanities	Grech, Maitland I.	Teacher	A.B.	Teaching
Home Economics	Greening, Jennie	Teacher	A.B.	Teaching
Mathematics	Gwinn, Paul	Principal	B.S. M.A.	Administration, Supervision and Teaching
Mathematics	Haas, Patricia	Teacher	A.B.	Teaching
Mathematics	Harden, Jean	Teacher	M.A.	Teaching

Area of Research	Name	Title/Position	Education	Experience
Industrial Arts Education	Hartenberger, Richard	Teacher	A.B.	Teaching
Humanities	Heclo, Ronald	Teacher	A.B.	Teaching
Mathematics	Hermann, Barbara	Teacher	A.B.	Teaching
Humanities	Hetherington, Delbert	Teacher	M.A.	Teaching
Humanities	Hinga, James	Teacher	A.B. Candidate for Master's	Teaching
	Hochkammer, Marcia	Teacher	B.S.	Teaching
Humanities	Hood, Kay	Teacher	A.B.	Teaching
Humanities	Horvath, Nancy	Teacher	A.B.	Teaching
Science and Humanities	Hubbard, Carol	Teacher	B.S.	Teaching
Humanities	Hurley, Dennis	Teacher	A.B.	Teaching
Mathematics	Hyry, William	Assistant Principal	B.S. M.A.	Administration and Teaching
Humanities	Jensen, Wilfred	Teacher	A.B.	Teaching
Humanities	Johnson, Charles	Teacher	B.S.	Teaching

Area of Research	Name	Title/Position	Education	Experience
Communication Skills	Jones, Toby	Teacher	A.B.	Teaching
Library Service	Jordan, Virginia	Librarian	B.S. M.L.S.	Supervision and Librarian
Humanities	Jositas, Geraldine	Teacher	B.S. M.A.	Teaching
Foreign Language	Kaler, Jana	Teacher	A.B.	Teaching
Science	Kamlay, Thomas	Teacher	A.B.	Teaching
Humanities and Mathematics	Kazuk, Betty	Teacher	A.B.	Teaching
Physical Education	Kebl, Al	Teacher	M.A.	Teaching
Music	Kendall, Julia	Teacher	B.M. M.A.	Teaching and Graduate Assistant
Mathematics	Kinter, Penny	Teacher	A.B. M.A.	Teaching
Humanities	Konikow, Claire	Teacher	A.B.	Teaching
Humanities	Kozek, Melvin	Teacher	A.B.	Teaching
Humanities	Kramer, Zina	Teacher	A.B.	Teaching
Humanities	Kuopus, Janette	Teacher	A.B. Candidate for Master's	Teaching

Area of Research	Name	Title/Position	Education	Experience
Business	Leavitt, Betty J.	Teacher	B.S. M.A.	Teaching
Humanities	Lucow, Celia	Teacher	A.B.	Teaching
Mathematics & Humanities	Lopshire, Linda	Teacher	A.B.	Teaching
Humanities & Mathematics	MacConnell, Nancy	Teacher	A.B.	Teaching and Reading Specialist
Mathematics	Maki, Richard	Teacher	A.B.	Teaching
Music	McGlone, Thomas H.	Teacher	A.B., M.A.	Band Director and Teaching
Science, Mathematics and Communication Skills	McGovern, Mary Ann	Teacher	B.S.	Teaching
Humanities	Minbiole, Barbara	Teacher	M.A.	Teaching
Industrial Arts Education	Monzo, Roy	Teacher	B.S., M.A. Doctoral Program	Teaching
Humanities	Mortimer, David	(Contracted Services)	B.S., M.A.	Teaching and Curriculum Development
Science	Nelson, Karen	Teacher	A.B.	Teaching

Area of Research	Name	Title/Position	Education	Experience
Mathematics	Newcomb, Geoffrey	Teacher	B.S.	Teaching and Electronics Technician
Mathematics	Newman, Barbara	Teacher	A.B.	Teaching
	Nori, Carole Jean	Teacher	B.S.	Teaching
Humanities	Pelton, Warren	System Coordinator	A.B., M.A. Doctoral Candidate	Supervision and Teaching
Science	Petersen, Carl	Teacher	M.A.	Teaching
Home Economics	Petersen, Karen	Teacher	B.S.	Teaching
Foreign Language	Phillips, Charles	Teacher	A.B., M.A.	Teaching
Humanities	Phillips, Marjorie	Teacher	B.S.	Teaching
Humanities	Pickering, Nona	Teacher	A.B.	Teaching
Art	Politzer, Jill	Teacher	A.B.	Teaching
Humanities	Potter, Judith	Teacher	A.B.	Teaching
Music	Price, Kerry	Teacher	A.B., M.M.	Teaching
Speech and Drama	Primm, William	Teacher	M.A.	Teaching
Physical Education	Quinn, Norman	Director of Physical Education	M.A.	Teaching and Administration

Area of Research	Name	Title/Position	Education	Experience
Humanities	Robbins, Suzanne	Teacher	Candidate for Master's	Teaching
Humanities	Robillard, Robert	Teacher	A.B.	Teaching
Science	Rolston, Donald	Teacher	B.S., M.A.	Teaching and Director of Summer Recreation
Communication Skills and Science	Rudd, Carole Lee	Teacher	A.B.	Teaching
Mathematics	Saporsky, Michael	Teacher	B.S., M.A.	Teaching
Mathematics	Schober, Jean	Teacher	B.S.	Teaching
Science	Schrot, William	System Coordinator Helping Teacher	B.S., M.A.	Teaching
Humanities	Schultz, Chester	Teacher	B.S., M.A.	Teaching
Humanities	Shuttleworth, Leslie	Teacher	A.B.	Teaching
Communication Skills	Skowron, Cynthia	Teacher	A.B.	Teaching
Science	Snyder, Wilma	Teacher	B.S., M.S.	Teaching
Humanities	Sonneborn, Janet	Teacher	A.B.	Teaching
Humanities	Sorgen, Martha	Teacher	A.B.	Teaching

Area of Research	Name	Title/Position	Education	Experience
Humanities	Sparre, Paul G.	Teacher	A.B. Candidate for Master's	Teaching
Mathematics	Spiess, David	Teacher	A.B.	Teaching
Humanities	Spriska, Richard	Teacher	B.S. Candidate for Master's	Teaching
Mathematics	Stein, Nancy	Teacher	A.B.	Teaching
Art	Stewart, Norman	Teacher	B.F.A.	Teaching
Communication Skills	Strait, Frances	Teacher	M.A.	Teaching
Humanities	Sundine, Albert	Teacher	B.S., M.A.	Teaching
Art	Swanton, Kim	Teacher	A.B.	Teaching
Humanities	Tamoor, Clarence	Counsellor	A.B., M.A.	Guidance and Counselling and Teaching
Humanities	Tolbert, Louise	Coordinator	A.B., M.A.	Supervision and Teaching
Science	Travis, Dennis	Teacher	B.S.	Teaching
Physical Education	Ullenbruch, William	Teacher	M.A.	Teaching

Area of Research	Name	Title/Position	Education	Experience
Humanities	Valway, Leonard	Teacher	M.A.	Teaching
Science	Velkoff, Stephen	Systems Coordinator	M.A.	Teaching and Administration
Foreign Language	Weingarden, Barbara	Teacher	A.B.	Teaching
Humanities	Woolley, Carol	Teacher	A.B. Candidate for Master's	Teaching
Communication Skills	Yeagley, Linda	Teacher	A.B.	Teaching

CONCLUSIONS, DATA EVALUATION, AND RECOMMENDATIONS

CONCLUSIONS

Results of the study:-- The results of this study provide data for meeting the specifications of General Objective I and for disseminating this information to the constituent members of the stated educational communities.

The stated criteria are:

> General Objective I
>
> To establish in all courses at the secondary level a curriculum model of behavioral objectives, which are approved by various experts, tested against relevant criteria, and tried out in actual classroom situations
>
> General Objectives II, III, and IV
>
> To disseminate information within the ES '70 Network of Schools, the Michigan State Department of Education, and the membership of the local community of Bloomfield Hills

Data for curriculum model:-- The stated behavioral objectives for the secondary courses will be ordered according to the type of objectives and will follow the numbering system for coding objectives to the Discipline Objectives and System Objectives.

The curriculum design provides components of content-classification structure indicated by the letter following the number of the discipline objective. These components include principles and theories, systems or subsystems, or natural events. Ordinarily, the coding to the discipline objective appears in the left margin. The coding would be illustrated by the following example:

> (BS) DO 2.0A -- The (BS) indicates that the discipline is Biological Science, the "DO" indicates that the reference is to a discipline objective, the "2.0" indicates that the objective is at a classification level, and the "A" indicates that the content of the objective refers to biological systems or subsystems.

Each Terminal-Performance Objective is coded to a discipline objective to indicate the cognitive level of the Terminal-Performance Objective. Coding reflects the highest level of thinking required of a student to fulfill the stated objective. In other words, if an objective requires the student to predict something based on his model, the objective would be coded at the 5.0 level, for the student would have to construct the model before he could make his prediction.

These Terminal-Performance Objectives specify the major goals for a student to succeed in a course. They are numbered with a letter prefix to designate the appropriate subject area, i.e., M -- mathematics, A -- art, and CS -- communication skills. A whole number, i.e., 1.0, 2.0, or 3.0, indicates that it is a terminal-performance objective. Thus, any given course will have as many terminal-performance objectives as it has major goals.

These major goals may represent concepts to be attained or they may represent skills. In either case the Terminal Performance Objectives generally represent topic subdivisions of the course rather than a sequence to be followed. That is, one should not assume that a student would be required to complete TPO 1.0, then 2.0, etc., in that order.

The Interim-Performance Objectives subdivide a terminal-performance objective into a series of steps necessary to attain the terminal. The Interim-Performance Objectives follow a decimal-numbering system under each terminal-performance objective. That is, interim-performance objectives for Terminal-Performance Objective 2.0 are numbered 2.1, 2.2, 2.3, 2.4, etc.

The Course Objectives organize various terminal- and interim-performance objectives into a teaching and/or learning sequence. In some cases they will be synonymous with an existing interim- or terminal-performance objective. In other cases, however, a single course objective can represent interim-performance objectives from two or more different terminal-performance objectives. These interrelationships are illustrated in Figure 34 , System Design for a Student-Centered Curriculum. In mathematics, for example, one terminal performance objective relates to the addition of whole numbers and another terminal-performance objective relates to place value. Nevertheless, in teaching, these two objectives are combined so that a student would be taught place value concurrently with regrouping in addition. When taken in toto, these course objectives represent every terminal- and interim-performance objective stated for a course and would maintain the same cognitive balance as the stated terminal-performance objectives. They serve as the bases for issuing course credit. To receive credit, evaluations of achievement completed by students are fulfilled according to the specifications of the course objectives. The Course Objectives are numbered sequentially with arabic numerals and the prefix CO. Unless otherwise specified, students are expected to complete them in order, e.g., CO1, CO2, CO3, etc. If necessary to subdivide a course objective, a decimal notation is used after the CO number, e.g., CO 1.1, CO 1.2, etc.

Course objectives are also coded to the discipline objectives using the technique described for the Terminal-Performance Objectives. Again, this coding would appear in the left margin next to the course objective.

FIGURE 34
SYSTEM DESIGN FOR A STUDENT-CENTERED CURRICULUM

Discipline	Content Classification			
	A	B	C	D
Art	Principles/Theories of design	Philosophy and man's expressions	Visual communications skills	
Behavioral Sciences	Principles/Theories of Behavior	Principles/ Procedures appropriate to behavioral research		
Biological Sciences	Biological System/ Subsystem	Principle/ Theory		
Business Education	Principle/ Procedure for a Systems Design and/or Manipulation of data within a System	Principle/ Procedure		
Communication Skills	Principles and procedures for formulating and transmitting messages	Principles and procedures for receiving messages	Principles and procedures for locating information	
Industrial Arts	System/ Subsystem	Principle/ Theory	Philosophy	
Humanities	Inter-Intra Relationships of man's expressions (political, economic, religious, social, intellectual, and artistic expressions)	Philosophy of man's experience	Occurrence (events created or caused by men)	

Discipline	Content Classification A	 B	 C	 D
Mathematics	Magnitude and measurement for abstract set of Symbols	Spatial, serial, numerical relations existing among objects of perception	Principles or models explaining interrelationships among mathematical subsystems	
Music	Principles/Theories of Music	Philosophy and music expression	Visual Communication Skills	Audio Communication skills
Physical Science	Natural Event (Event over which man has no control.)	Principle/ Theory	System/ Subsystem	
Home Economics	Principles and procedures for preparing foods	Principles and procedures for home management	Principles and theories of design	System/Subsystem (system of clothing construction, system of family relationships as they relate to society, etc.)
Literature	Principle/ Theory	Man's Expressions		
Physical Education	Physiological Principles			
Foreign Languages	Principles and procedures for formulating and transmitting messages in a second language	Principles and procedures for receiving messages in a second language	Principles and procedures for locating information in a second language	

Each of the disciplines listed in Figure 34 has been coded into a system of symbols for its descriptor, as follows:

A -- Art
BS -- Biological Sciences
B -- Business Education
IE -- Industrial Education
H -- Humanities
HE -- Home Economics
M -- Mathematics
Ms -- Music
PS -- Physical Science
L -- Literature
PE -- Physical Education
CS -- Communication Skills
FL -- Foreign Languages

Lastly, the design of the curriculum defines Basic-Skills Objectives. These are the objectives which are so elemental and important that without them a child would experience a pinioning effect in continuing his education. Justifiably, these are the objectives that must be attained by a child with minimum educational potential in order to be graduated from high school.

Sample objectives: -- The conceptual model of the curriculum to individualize instruction has been constructed based on objectives which meet the specifications of the curriculum design and function at a predetermined instructional level and flow through the steps of the cognitive hierarchy. The following objectives are examples which illustrate the cross-referencing of cognitive skills horizontally and the keying of lower-level to higher-level objectives vertically. Objectives have been selected from six of the major subject-matter learning areas: Humanities, Mathematics, Science, Foreign Language, Music, and Art.

TABLE 3
CONCEPTUAL MODEL OF BEHAVIORAL OBJECTIVES
HUMANITIES

Prerequisites

IPO 1.1 Given four case studies each illustrating leadership qualities exhibited by a given individual and given charts for rating the leadership qualities of each individual, the learner will construct a rating for each individual and will describe similarities and differences among the given leaders in relation to at least five characteristics from at least three of the general categories contained on the rating chart.

1.1a Given a rating chart containing both general categories and specific sub-categories to be used rating the leadership qualities of any given individual, the learner will identify, name, and describe both the general and specific categories as they relate to leadership qualities with 80% accuracy or greater.

1.1b Given a rating chart containing both general categories and specific sub-categories to be used in rating the leadership qualities of any given individual, the learner will describe similarities and differences between and among the general and sub-categories with at least 80% accuracy.

1.1c Given a list of leadership qualities of a given individual and a chart containing both general categories and specific sub-categories to be used in rating the leadership qualities of any given individual, the learner will construct a classification of the leadership qualities of the given individual and describe them in the appropriate spaces on the rating chart with at least 80% accuracy.

IPO 1.2 Given the four case studies from 1.1, each illustrating the political, social, and economic situation during which each individual maintained a leadership role, and given a rating chart for specific aspects of the political, social, and economic situations, the learner will describe the similarities and differences among the three general categories, using at least two specific aspects from each general category on the rating chart.

IPO 1.3 Given the four case studies and his completed rating charts from 1.1 and 1.2, the learner will describe relationship(s) between each leader's characteristics and the situational characteristics in each given situation.
(The conclusions drawn must be logically derived from and supported by the data given.)

CO 20 (12 days) Hypothesize Degree of Success for Given Leader

Given the leadership qualities of a specific individual, his goal (s), a rating of the political, social, and economic situation at the time he was attempting to attain his goal(s), and given the learner's classification of leadership qualities based on a series of case studies, the learner will construct a hypothesis as to the degree to which the individual is likely to be successful in attaining his goal(s). (The hypothesis must be logically derived from and supported by the data given.)

IPO 1.4 Given a series of examples of the following types:

(1) At least one of which depicts the leadership qualities of a pair of individuals both attempting to reach the same goal(s), one identified as unsuccessful, and given ratings of the political, social, and economic situations under which each attempted to reach his goal(s), the learner will state rules describing the correlation between each individual's effectiveness and

IPO 1.5 Given his rules from 1.4, the learner will construct a classification of the various leadership qualities from most effective to least effective as these relate to the success of an individual in attaining his goals.
(This classification must be logically derived from and supported by the data given.)

his leadership qualities and/or the correlation, between each individual's effectiveness and the given situations.

(2) At least one of which depicts a pair of individuals having similar leadership qualities, both identified as approximately equal in their effectiveness in attaining their goals, and given ratings of the political, social, and economic situations under which each individual attempted to reach his goal(s), the learner will state rule(s) describing the correlation between each individual's effectiveness and the given situations.

(3) At least one of which depicts a pair of individuals having different leadership qualities and the same social, political, and economic situation during which each was attempting to attain his goal(s), and given a rating chart of specific aspects of those three general categories, the learner will state rule(s) describing the correlation between each individual's leadership qualities and the given situation.

HUMANITIES (Cont.)

(All stated rules must be logically derived from and supported by the data given.)

TPO 1.0 Given the leadership qualities of a specific individual, his goal(s), a rating of the political, social, and economic situation at the time he was attempting to attain his goal(s), and given the learner's classification of leadership qualities from IPO 1.5, the learner will construct a hypothesis as to the degree to which the individual is likely to be successful in attaining his goal(s).
(The hypothesis must be logically derived from and supported by the data given.)

HDO 3.0A Given specific data at his level of instruction, the learner will construct a hypothesis and/or prediction based on his classification of data as it relates to the inter-intra-relationships of man's expressions.

SO 1 Given an appropriate stimulus at his level of instruction, the learner will describe without further instruction his observation.

SO 2 Given an appropriate stimulus at his level of instruction, the learner will construct inferences based on his observations.

SO 3 Given appropriate stimuli at his level of instruction, and the direction to classify, the learner will construct sub-divisions into several categories of increasing specificity.

HUMANITIES (Cont.)

SO 10 Given a class of objects and/or events, and/or concepts, the learner will:

- a. Correctly name objects and/or events, and/or concepts, and describe appropriate characteristics which distinguish each object, event, or concept from any other.
- b. Demonstrate a method for classifying objects, and/or events, and/or concepts based on common attributes.

SO 14 Given any stimulus at his level of instruction, the learner will describe the content of the materials.

SO 18 Given stimuli at his level of instruction containing one or more implied relationships, the learner will describe the relationships consistent with the data.

SO 19a Given a problem at his level of instruction, the learner will describe and/or demonstrate a procedure for: a. Hypothesizing

MATHEMATICS

CO 4 Given at least 10 exercises which reflect the following concepts at his level of instruction:

a. Relations
b. Linear relations
c. Functions
d. Arithmetic of functions
e. Polynomials
f. Arithmetic of polynomials
g. The Factor Theorem
h. Rational Root Theorem
i. Descartes' Rule of Sign and Bounds for Real Roots,

the learner will construct the solution sets with at least 70% accuracy.

IPO 12.1 Given the following terms: domain, range, relation, linear relation, half-plane, function, greatest integer function, identity function, and the definitions in MEA-3[1] and examples of each but in random order, the learner will identify the term with its example.

IPO 12.2 Given the above terms and their definitions, the learner will describe the terms.

IPO 12.3 Given the following pairs of terms: domain and range, relation and function, the learner will describe similarities and differences between the terms.

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[1] Dolciani, Modern Introductory Analysis (Houghton-Mifflin, 1967).

MATHEMATICS (Cont.)

IPO 12.4 Graphing pre-requisite from Algebra II for linear relations and special functions.

IPO 12.5 Given the following terms, equal functions, sum of two functions, product of two functions, negative of a function, reciprocal of a function and their definitions and a list of examples of each, the learner will identify the examples with the term.

IPO 12.6 Given the above terms and definitions, the learner will describe each of the terms.

IPO 12.7 Given a procedure to construct the sum, product, negative, and reciprocal of functions, the learner will state the rules for constructing the above arithmetic operations on functions.

IPO 12.8 Given two functions the learner will demonstrate a procedure to construct arithmetic relations between the functions.

TPO 12.0 Given three functions, f, h,g, specified by roster or rule, the learner will demonstrate a procedure for finding specified arithmetic relations (+, -, X, ÷) among the functions.

The learner will do all the above with at least 70% accuracy.

MDO 2.0C Given specific data at his level of instruction, the learner will construct an hypothesis or prediction or classification of data based on his interpretation as it relates to a set of principles and/or models which explain the interrelationships of mathematical subsystems.

SO 1 See Page 135.

SO 2 See Page 135.

SO 3 See Page 135.

SO 10 See Page 136.

SO 14 See Page 136.

SO 16 Given a set of direction at his level of instruction, the learner will demonstrate a procedure for carrying out the required tasks.

MATHEMATICS (Cont.)

IPO 13.1 Given the definitions of the list of terms, operations, and theorems in TPO 13.0, and a set of examples, the learner will identify and name the components of the given as they relate to finding real roots of polynomial equations.

IPO 13.2 Given the attached list of terms, operations, and thorems, the learner will describe each component as it relates to finding real roots of polynomial equations.

IPO 13.3 Given examples of synthetic substitution and synthetic division, the learner will describe similarities and differences of the given as they relate to finding real roots of polynomial equations.

IPO 13.4 Given the terms, operations, and theorems, and examples showing relationships between two or more components as they relate to finding real roots of polynomial equations.

IPO 13.5 Given the above list of terms, operations, and theorems, and at least 10 exercises related to finding real roots of polynomial equations, the learner will state the rules for constructing roots of polynomial equations as they relate to the exercises.

IPO 13.6 Given the list of terms, operations, and theorems for TPO 13.0, and at least 10 exercises related to finding real roots of polynomial equations, the learner will demonstrate procedures for constructing the solution sets.

TPO 13.0 Given the definitions of the following list of terms, operations, and theorems and 4 exercises related to function, real roots of polynomial equations, the learner will construct the solution sets.

MATHEMATICS (Cont.)

MDO 2.0C See Page

SO 1 See Page 135.

SO 2 See Page 135.

SO 3 See Page 135.

SO 10 See Page 136.

SO 14 See Page 136.

SO 16 See Page 138.

Terms

polynomial over a field F
polynomial functions
constant term
leading coefficient
polynomial equation
zeros and roots
m -fold factor
multiplicity
variation in sign
nested forms

Operations

synthetic substitution
division algorithm
synthetic division

Theorems

Remainder Theorem
Theorem (p. 239) -- A polynomial of degree n over F has at most n zeros in F

Factor Theorem
Theorem (240) -- If $(x-a)$ is an m-fold factor of a polynomial $P(x)$ over F and if $P(x) = (x-a)^m Q(x)$, then b is a root of $P(x) = 0$ if b is a root of $Q(x) = 0$
Theorem for determining upper and lower bounds on roots

The learner will do all of the above with at least 70% accuracy.

SCIENCE

CO 22 Types of Energy

Given the resources to find the definitions and/or descriptions of the terms in List N (TPO 6.0) and of kinetic and potential and of the Laws of Conservation of Matter and Conservation of Energy, examples of the types of energy, a basic set of lab materials, and an activity situation at his level of instruction, the learner will classify the types of energy based upon the definitions and/or descriptions and/or Laws above with 70% accuracy or greater.

CO 23 Kinds of Energy

Given the resources to find the definitions and/or descriptions of List N, List O (TPO 6.0), and chemical, examples of the kinds of energy and activity situations at his level of instruction, the learner will classify the kinds of energy based upon the definitions and/or descriptions and/or Laws above with 70% accuracy or greater.

CO 24 Transformation of Energy

Given the resources to find the definitions and/or descriptions of List N, List O and chemical, examples of the kinds of energy and activity situations at his level of

PS DO 2.0A Given specific data at his level of instruction, the learner will construct an hypothesis or prediction or classification based on his interpretation of the data as it relates to a natural event.

instruction, the learner will classify the kind of energy necessary to produce a given transformation of energy based upon the definitions and/or descriptions above, with 70% accuracy or greater.

CO 25 Effects on Chemical and Physical Changes

Given the resources to find the definitions and/or descriptions of List N, List O, and activity situations at his level of instruction, the learner will classify the kind of energy necessary to produce a given chemical or physical change based upon the definitions and/or descriptions above with 70% accuracy or greater.

IPO 6.1 Identify and name the components of list N and List O and kinetic, potential, and chemical with 100% accuracy.

IPO 6.2 Describe the specified components, the types and kinds of energy, the kinds of energy necessary to produce a given transformation and a given chemical or physical change with 70% accuracy or greater.

IPO 6.3 Describe the similarities and differences of the specified components as they relate to the types and kinds of energy, the kind of energy necessary to produce a given transformation and a given chemical or physical change with 70% accuracy or greater.

SCIENCE (Cont.)

IPO 6.4 Describe the relationships between the specified components, the types and kinds of energy, the kind of energy necessary to produce a given transformation, and a given chemical or physical change with 70% accuracy or greater.

IPO 6.5 State the rules concerning specified components as they relate to the types and kinds of energy, the kind of energy necessary to produce a given transformation and a given chemical or physical change with 70% accuracy or greater.

IPO 6.6 Demonstrate procedures for constructing a classification of the types and kinds of energy, the kind of energy necessary to produce a given transformation and a given chemical or physical change with 70% accuracy or greater.

TPO 6 Effects of Energy on Matter

Given the resource materials to find the definitions and/or descriptions of the terms in List N and List O and of kinetic, potential, and chemical
the resource materials to find the Law of Conservation of Matter and the Law of Conservation of Energy

SCIENCE (Cont.)

TPO 6 (Cont.) examples of the types of energy and the kinds of energy

a basic set of lab materials and an activity situation at his level of instruction

the learner will classify the types and kinds of energy, the kind of energy necessary to produce a given transformation and a given chemical or physical change based upon the interpretation of the definitions and/or descriptions and the given Laws

with 70% accuracy or greater.

List N	List O
energy	heat
work	radiant
force	electricity
resistance	sound
matter	mechanical
	muscular
	atomic

FOREIGN LANGUAGE

CO 10 Given a topic at his level of instruction, the learner will construct a model based on the results of his experiment as they relate to the construction of an original composition of more than three paragraphs with a minimum of 150 words and an accuracy equal to or greater than the predetermined minimum level.

IPO 1.1 Given the characteristics of (1) infinitives, (2) present, preterite, and future regular and irregular verbs, (3) imperatives, (4) stem-changing verbs, (5) reflexive verbs, and (6) defective verbs and a list of verbs at his level of instruction, the learner will identify each verb form with 100% accuracy.

IPO 1.2 Given a list of verbs at his level of instruction, the learner will name the (1) infinitives, (2) present, preterite, and future regular and irregular verbs, (3) imperatives, (4) stem-changing verbs, (5) reflexive verbs, and (6) defective verbs with 100% accuracy.

IPO 1.3 Given a list of verbs at his level of instruction, the learner will describe the (1) infinitives, (2) present, preterite, and future regular and irregular verbs, (3) imperatives, (4) stem-changing verbs, (5) reflexive verbs, and (6) defective verbs with 80% accuracy or greater.

IPO 1.4 Given a list of verbs at his level of instruction, the learner will describe similarities and differences between and among (1) infinitives, (2) present, preterite, and future regular and irregular verbs, (3) imperatives, (4) stem-changing verbs, (5) reflexive verbs, and (6) defective verbs with 80% accuracy or greater.

FL DO 5.0A Given specific data at his level of instruction, the learner will construct a model based on the results of his experiment as it relates to principles and procedures of formulating and transmitting messages in a second language with accuracy equal to or greater than the predetermined minimum level.

SO 3 See Page 135.

SO 4 See Page 149.

SO 10 See Page 136.

SO 11 Given any assignment at his level of instruction, the learner will apply one or more of the following rules:

FOREIGN LANGUAGE (Cont.)

IPO 1.5 Given a list of verbs at his level of instruction, the learner will describe relationships between and among (1) infinitives, (2) present, preterite and future regular and irregular verbs, (3) imperatives, (4) stem-changing verbs, (5) reflexive verbs, and (6) defective verbs with 80% accuracy or greater.

IPO 1.6 Given a list of infinitives at his level of instruction the learner will state rule(s) for constructing appropriate (1) present, preterite, and future regular and irregular verb forms, (2) imperatives, (3) stem-changing verb forms, (4) reflexive verb forms, and (5) defective verb forms with 70% accuracy or greater.

IPO 1.7 Given a list of verbs at his level of instruction, the learner will demonstrate procedures for incorporating appropriate verb forms into a self-constructed oral and/or written complete sentence(s) with 70% accuracy or greater.

TPO 1.0 Given a list of verbs containing (1) infinitives, (2) present, preterite, and future regular and irregular verbs, (3) imperatives, (4) stem-changing verbs, (5) reflexive verbs, and (6) defective verbs at his level of instruction, the learner will demonstrate procedures for incorporating appropriate verb forms into a self-constructed oral and/or written paragraph(s) based on his classification of the above data with 70% accuracy or greater.

SO 11 (Cont.)

a. Demonstrate a procedure for writing that results in a product that conforms to the rules set forth by the English Dept.

b. Write legibly. (Demonstrate a procedure for writing that results in a product that can be read by ________________.)

c. Apply the rules relating to capitalization at the beginning of each sentence, the word I, all proper names, and titles.

d. Express ideas in complete sentences.

e. Apply the rules relating to subject-verb agreement.

FOREIGN LANGUAGE (Cont.)

IPO 2.1 Given the characteristics of nouns and a list of words at his level of instruction, the learner will identify each noun with 100% accuracy.

IPO 2.2 Given a list of words at his level of instruction, the learner will name the nouns with 100% accuracy.

IPO 2.3 Given a list of words at his level of instruction, the learner will describe the nouns with 80% accuracy or greater.

IPO 2.4 Given a list of nouns at his level of instruction, the learner will describe similarities and differences between and among nouns with 80% accuracy or greater.

IPO 2.5 Given a list of nouns at his level of instruction, the learner will describe relationships between and among the nouns with 80% accuracy or greater.

IPO 2.6 Given a list of nouns at his level of instruction, the learner will state rule(s) for constructing a sentence in which the appropriate noun form is employed with 80% accuracy or greater.

IPO 2.7 Given a list of nouns at his level of instruction, the learner will demonstrate procedures for incorporating appropriate noun forms into a self-constructed oral and/or written sentence(s) with 70% accuracy or greater.

TPO 2.0 Given a list of nouns (singular and plural, masculine and feminine) at his level of instruction, the learner will demonstrate procedures for incorporating appropriate nouns into a self-constructed oral and/or written paragraph(s) based on his interpretation of the above data with 70% accuracy or greater.

SO 11 (Cont.)

f. Apply the rules relating to correct verb tense.

g. Order sentences into coherent paragraphs.

h. Order paragraphs into coherent compositions.

i. Apply specified rules relating to notation and punctuation for any appropriate form of communication.

j. Apply a specified set of rules for the regulation of group discussion.

SO 12 Given a set of directions and any audio and/or visual presentation at his level of instruction, the learner will describe pertinent information into said categories.

FOREIGN LANGUAGE (Cont.)

IPO 3.1 Given the characteristics of (1) subject pronouns, (2) direct object pronouns, (3) indirect object pronouns, (4) prepositional pronouns, (5) reflexive pronouns, (6) demonstrative pronouns, (7) possessive pronouns, and (8) the impersonal subject pronoun, se, at his level of instruction and a list of pronouns, the learner will identify each pronoun with 100% accuracy.

IPO 3.2 Given a list of pronouns at his level of instruction, the learner will name each pronoun with 100% accuracy.

IPO 3.3 Given a list of pronouns at his level of instruction, the learner will describe each pronoun with 80% accuracy or greater.

IPO 3.4 Given a list of pronouns at his level of instruction, the learner will describe similarities and differences between and among the pronouns with 80% accuracy or greater.

IPO 3.5 Given a list of pronouns at his level of instruction, the learner will describe relationships between and among the pronouns with 80% accuracy or greater.

IPO 3.6 Given a list of pronouns at his level of instruction, the learner will state rule(s) for constructing a sentence in which the appropriate pronoun form is employed with 70% accuracy or greater.

IPO 3.7 Given a list of pronouns at his level of instruction, the learner will demonstrate procedures for incorporating appropriate pronoun forms into a self-constructed oral and/or written complete sentence(s) with 70% accuracy or greater.

TPO 3.0 Given a list of pronouns containing (1) subject pronouns, (2) direct object pronouns, (3) indirect object pronouns, (4) prepositional pronouns, (5) reflexive pronouns, (6) demonstrative

SO 13 Given a set of directions and any audio and/or visual presentation at his level of instruction, the learner will describe pertinent information and information obtained from another specified source.

SO 14 See Page 136.

SO 16 See Page 138.

SO 19 Given a problem at his level of instruction, the learner will describe and/or demonstrate a procedure for:

a. Hypothesizing

b. Controlling variables

c. Interpreting data

d. Formulating models

e. Applying a rule or rules

FOREIGN LANGUAGE (Cont.)

TPO 3.0 (Cont.) pronouns, (7) possessive pronouns, and (8) the impersonal subject pronoun, se, at his level of instruction, the learner will demonstrate procedures for incorporating appropriate pronoun forms into a self-constructed oral and/or written paragraph(s) based on his classification of the above data with 70% accuracy or greater.

SO 4 Given appropriate stimuli at his level of instruction, the learner will identify major and subordinate ideas presented and given appropriate stimuli at his level of instruction, the learner will distinguish major and subordinate ideas from supporting context.

MUSIC

Choral Music Prerequisites

(Coding: K -- knowledge, I -- interpretation, C -- classification)

(I) 1. Upon hearing a sequence of notes at his level of instruction, the learner shall describe the sequence of terms of its movement: up, down, or remaining the same.

(I) 2. Given the notation to a sequence of notes at his level of instruction, the learner shall describe the sequence in terms of its movement: up, down, or remaining the same.

(K) 3. Given musical notation at his level of instruction, the learner shall identify by name the following basic music symbols: staff, line, space, measure, bar line, treble clef, bass clef, with at least 90% accuracy.

(K) 4. Given musical notation at his level of instruction, the learner shall identify the notes and rests by name with at least 90% accuracy (whole, half, quarter, eighth, sixteenth notes and rests).

(K) 5. Given musical notation at his level of instruction, the learner shall identify the letter names of the notes on the treble staff with at least 90% accuracy.

(I) 6. Given a series of single rhythmic figures, the learner shall describe the relationships between them, with at least 85% accuracy.

(I) 7. Given prepared materials at his level of instruction, the learner shall describe the function of the time signature, with at least 85% accuracy.

(C) 8. Given materials which list a time signature, and the following rhythmic figures, the learner shall order them into appropriate measures and sing, chant, or clap those measures with at least 85% accuracy (whole, half, quarter notes and rests, in Base 4 time).

Ms DO 2.0A Given specific data at his level of instruction, the learner will construct a classification based on his interpretation of the data as they relate to principles/theories of music with accuracy equal to or greater than the predetermined minimum level.

SO 1 See Page 135.

SO 10 See Page 136.

SO 16 See Page 138.

SO 17 Given any stimulus at his level of instruction in which the information is presented in one form, the learner will describe the material in another specified form.

MUSIC (Cont.)

CO 2 Given materials which list a time signature and the following rhythmic figures, the learner shall order them into appropriate measures and sing, chant, or clap those measures with at least 75% accuracy (whole, half, quarter, eighth notes and rests, in Base 4 and 8 time).

SO$^{\nabla}$19 c, e Given a problem at his level of instruction, the learner will describe and/or demonstrate a procedure for:

c. Interpreting data

e. Applying a rule or rules

ART

CO 31 Sterling Textured Forging

Given the appropriate materials (Listed below), the learner shall construct a design and a sterling silver jewelry piece by the process of centrifugal casting. The final work shall meet the prestated standards of design and workmanship.

Appropriate materials: (See page 153.)

IPO 5.1 Given the appropriate tools and materials for the task, the learner shall name those tools and materials necessary to construct to a 90% degree of accuracy.

IPO 5.2 Given the appropriate tools, techniques, and materials for this task, the learner shall demonstrate proper use of the tools and equipment.

IPO 5.3 Given pencil and paper, the learner shall construct a design sequence relating to a centrifugally casted sterling silver jewelry piece.

IPO 5.4 Given his chosen design and appropriate materials, the learner shall construct, to scale, a three-dimensional wax model of his design.

IPO 5.5 Given the appropriate materials, the student shall demonstrate the technique of determining the volume of the wax model to a 99% degree of accuracy.

IPO 5.6 Given the appropriate materials, the student shall demonstrate the techniques involved with investing the wax model

IPO 5.7 Given the appropriate material, the learner shall demonstrate the process of "burn out" to full completion.

IPO 5.8 Given appropriate materials, the learner shall demonstrate the procedures involved with preparing the casting machine.

ADO 5.0A Given specific data at his level of instruction, the learner will construct a model based on the results of his experiment as it relates to principles/theories of design.

SO 10 See Page 136.

SO 14 See Page 136.

SO 16 See Page 138.

SO 17 See Page 150.

SO 19 See Page 151.

IPO 5.9 Given appropriate materials, the learner shall demonstrate the technique of balancing the casting swing arm to a 99% degree of accuracy.

IPO 5.10 Given appropriate materials, the learner shall demonstrate the procedures involved with the injection of moulton sterling silver into the mold.

IPO 5.12 Given the appropriate materials, the learner shall demonstrate the technique of buffing and polishing sterling silver by removing all imperfections in the metal (final finishing).

TPO 5.0 Given the appropriate materials, *the learner shall construct a design and a sterling silver jewelry piece by the process of centrifugal casting. The final work shall meet the prestated standards of design and workmanship.

* Appropriate Materials

1) All applicable tools from TPO's 1.0, 2.0, 3.0, and 4.0
2) Kerr "centrifico casting machine" (complete)
3) Jewelers' modelling wax (in assorted grades and shapes)
4) Alcohol burner
5) Wax modelling tools
6) Assorted dowel rods

ART (Cont.)

7) Wax paper and aluminum foil

8) Assorted casting investment rings with funnels

9) Investment compound (cristobolite)

10) Investment vibrator

11) Debubblizer and brush

12) Jewelers' burn-out kiln

13) Acetylene torch and strikes

14) Casting crucible

15) Investment ring tongs

16) Asbestos gloves

17) Graduated cylinder

18) Asbestos stripling

19) Water source

Standards of Design and Workmanship

Design -- 1. Exhibit originality

2. Exhibit studies
design element(s)

ART (Cont.)

Workmanship -- 1. Controlled execution of media

2. Clean presentation: no smudges or non-predetermined foreign particles as part of the work, etc.

DATA EVALUATION

QUALITY-CONTROL CHECKS

To determine the point of departure for conducting research in the three experimental schools, K-12, instruments were constructed to collect data on the development of the continuous-progress curriculum within these participating schools. Instruments in the form of Quality-Control Checks were administered primarily to provide data to determine "the state of the art" at any one point in time.

A quality-control was made in December 1967 of those courses for which performance objectives had been constructed. Data resulting from these controls were critically analyzed to give direction for formulating future plans. These results[1] indicated many courses which were highly developed and others had only limited numbers of evaluative instruments, self-instructional materials, adequate machines, and the like. For example, according to Figure 4, based on responses to the question, "Have you overcome the problems of individualizing instruction?", opinions gave evidence that strategies for individualizing instruction are being implemented but much yet remained to be accomplished.

TABLE 4

SECONDARY TEACHER RESPONSES TO QUALITY-CONTROL CHECK

QUESTION: HAVE YOU OVERCOME THE PROBLEMS OF INDIVIDUALIZING INSTRUCTIONS?

N_1 = 25 (senior high) N_2 = 11 (junior high)

YES		NO	
Degree	Number	Degree	Number
But not entirely	11	But anticipate improvement	4
But only 50/50	11	Some problems remain	5
But very little	1	Not at all	4
	23		13

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[1] See Appendix C , p. 308.

A year later the results[1] of the quality-control checks reflected the fact that Bloomfield Hills was conducting a research project resulting in an analysis of the construction of the behavioral objectives. For the elementary level all instructional areas were completely defined except the social sciences, for the junior-high level weaknesses were noted in French, Home Economics, Industrial Education, and Mathematics Concepts. Support was needed at the senior-high level for new courses in particular; these included: Contemporary Literature, World Literature, Journalism, Drama, Mathematics Concepts, Advanced Science, Spanish III and IV, and German. At this level the respondents indicated areas still in need of revision of objectives to meet the performance specifications. The Summary Sheet for Lahser High School lists the following: American Cultures, European Studies, Intellectual History of Western Man, Fundamental Writing, Algebra I and II, Calculus, Physics, French III and IV, Spanish I and II, Foods, Clothing, Interior Design, Machine Technology, Electronics, Materials Processing, Art, and Graphics.

TREATMENTS OF BEHAVIORAL OBJECTIVES

During the summer of 1968 Phase I of the research study was conducted with the results of the workshop classified in Table 5. As a result of critical analysis based on the criteria of the research goals, objectives were eliminated, rewritten, replaced, or changed.

In concluding Phase II of the project (October 15, 1969), behavioral objectives were revised as needed to conform to the performance specifications, objectives were constructed for new courses, and additional new objectives were designed to fill gaps and to complete courses. (Table 6.)

A tabulation of the completed course objectives is arrayed in Table 7. These objectives are listed for the five levels of the cognitive processes identified in the continuous-progress-curriculum design. It was obvious that a large number of the course objectives were related directly to classification tasks. It would be expected that as students progress through the program, they will become more skill oriented and more objectives will be needed for the higher levels of the cognitive hierarchy. Table 8.)

In order to put the course objectives in proper perspective to achieve the criteria of the discipline-objective expectations, they were tabulated by design classification of the discipline objectives in Table 9. This table makes a strong case for equating the objectives among the three divisions with the predominance representing the first division.

STATISTICAL ANALYSES

In addition to the data gathered directly from the research study groups and field-tests, a statistical analysis was completed in the spring of 1969 of data resulting from additional testing to compare the traditional and continuous-progress schools. To obtain the

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[1] See Appendix D, p. 317.

TABLE 5 COMPOSITE REPORT OF BEHAVIORAL OBJECTIVES CHANGES
October 15, 1968

	Art	Behavioral Science	Business	Communication Skills	Humanities	Foreign Language	Industrial Education	Mathematics	Music	Physical Education	Science
Four Parts - A la Mager			87	3				13			7
Clarity	3		87	32		33	142	43		48	20
Minimum Performance			33	12		33	142	14		48	21
Time Factor Changed			14				142	22			16
Objective Eliminated				107	49	39	63	10	9	179	3
Objective Replaced (Same number-entirely new)	5			14		33	12				31
New Objective (Course and/or number)		5	3	48	186		140	66	4	48	22
Sequence Change (Indicate previous number)			25	18		33	93	8		48	25

TABLE 5 COMPOSITE REPORT OF BEHAVIORAL OBJECTIVES CHANGES (Cont'd)

October 15, 1968

	Art	Behavioral Science	Communication Skills	Humanities	Foreign Language	Industrial Education	Mathematics	Music	Physical Education	Science
Materials Added (Commercial)		8				145	16			2
Materials Added (Teacher-Dev.)		30			33	89	30	9	48	27
Learning Strategies Added		82			33	89	32		48	
Pre-Test Developed	5	12			33	89	56	9	48	
Post-Test Developed	5	59			33	83	56		48	15
Prerequisites Identified		13	308			51	21			
Coded to Discipline Objective		87			33	145	56		48	

TABLE 6 AREAS OF STUDY CATEGORIZED BY TYPE OF BEHAVIORAL OBJECTIVE OR MATERIALS

DISCIPLINE	ART	FOREIGN LANGUAGE				MUSIC	HOME EC.	MATHEMATICS					
Courses	All Courses	Basic Spanish	Academic Spanish	Basic French	Academic French	All Courses	Family Living	Algebra I	Algebra II	Trigonometry	Geometry	Elementary Analysis	Calculus
Terminal Performance Objectives	R	N	R	N	R	R	N	R	R	R	R	R	N
Interim Performance Objectives	R	N	R	N	R	R	N	R	R	R	R	R	N
Course Objectives	R	N	R	N	R	R	N	R	R	R	R	R	N
Materials Coded	C	N	C	N	C	C	N	C	C	C	C	C	N
Teacher Packets							N	C	C	C	C	C	
Student Materials	C						N	C	C	C	C	C	

Key N - New
R - Revised
C - Completed

TABLE 6 AREAS OF STUDY CATEGORIZED BY TYPE OF BEHAVIORAL OBJECTIVE OR MATERIALS (Cont'd)

DISCIPLINE	PHYSICAL ED.	SCIENCE					HUMANITIES										
Courses	All Courses	Biological Science	Biology I	Biology II	Physics	Chemistry	American Cultures	Basic Composition	High School Composition	American Literature	World Literature	Creative Writing	Communication Media	Area Studies	American Government	American History	Shakespeare
Terminal Performance Objectives	R	N	R	R	N	R	N	N	N	N	N	N	N	N	N	N	N
Interim Performance Objectives	R	N	R	R	N	R	N	N	N	N	N	N	N	N	N	N	N
Course Objectives	R	N	R	R	N	R	N	N	N	N	N	N	N	N	N	N	N
Materials Coded	C	N	C	C	N	C	N	N		N		N	N	N	N	N	
Teacher Packets	C	N	C	C	N	C	N			N		N	N	N	N	N	
Student Materials			C							N		N	N	N	N	N	

Key N - New
R - Revised
C - Completed

TABLE 7

COURSE OBJECTIVE EVALUATION CHART

		No. of CO's per Cognitive Process				No. of CO's per Discipline Objective Classification		
Discipline	Course	Interpreting	Classifying	Hypothesizing	Constructing a Model	DO-A	DO-B	DO-C
Art	9th Adv. 10th Beg.	14	16			30		15
Art	Jewelry	12	25			37		16
Spanish	Level 1		14				14	14
Spanish	Level 2		9		1	10	10	1
Spanish	Level 3				4	4	4	4
Spanish	Level 4				4	4	4	4
Humanities	American Literature	2	2	5				9
Humanities	U.S. History	13	8	4		11	10	4

TABLE 8 COURSE OBJECTIVES FOR THE COGNITIVE PROCESSES

Cognitive Process	7th Art	8th Art	9th & 10th Art	Art II	Adv. Art	Spanish I	Spanish II	Spanish III	Spanish IV	8th & 9th Humanities	American Gov.	American Lit.
Interpreting	3	4	14		12					1		2
Classifying	7	9	16	14	25	14	9			9	11	2
Hypothesizing				3						8	11	5
Experimenting				3						1		
Constructing a Model				3			1	4	4	1		

TABLE 8 COURSE OBJECTIVES FOR THE COGNITIVE PROCESSES (Cont'd)

Cognitive Process	Basic Comp.	Communication Media	High School Comp.	U. S. History	Elem. Analysis	Calculus	Gen. Music	Choral Music	Strings	Beg. Band	School Band	7th Science	8th Science	Biological Science	Biology I	Biology II
Interpreting				7		4	4	4		2		8	4	27	28	10
Classifying	9	13	7	9	6	6	12	10	8	11	14	5	19	1	2	
Hypothesizing		1		4		2						4	7			5
Experimenting																
Constructing a Model																

TABLE 9 CLASSIFICATION OF COURSE OBJECTIVES BY DISCIPLINE OBJECTIVES

Discipline	Course	No. of CO's per Discipline Objective Classification		
		DO-A	DO-B	DO-C
Art	7th Grade	10		5
	8th Grade	13		5
	9th and 10th	30		15
	Art II	23		9
	Advanced Art	37		16
Foreign Language	Spanish I	14	14	
	Spanish II	10	10	1
	Spanish III	4	4	4
	Spanish IV	4	4	4
Humanities	8th and 9th	20		
	American Government	6	14	2
	American Literature			9
	Communication Media		14	
	U. S. History	10	6	4
Mathematics	Elementary Analysis		3	3
	Calculus	9	3	

TABLE 9 CLASSIFICATION OF COURSE OBJECTIVES BY DISCIPLINE OBJECTIVES (Cont'd)

Discipline	Course	No. of CO's per Discipline Objective Classification		
		DO-A	DO-B	DO-C
Music	General	4	12	
	Choral	4	20	
	Strings		8	
	Beginning Band	13		
	School Band	14		
Science	General Science	4	4	9
	8th Grade	14	16	
	Biological	25	3	
	Biology I	26	4	
	Biology II	3	16	

necessary data, The Iowa Test of Educational Development was administered to all twelfth-grade students and The Iowa Tests of Basic Skills were administered to all ninth-grade students. A statistical analysis of covariance, which took into consideration initial differences, indicated there were no significant differences in achievement based on the results of these tests between the schools served by behavioral objectives and the traditional schools except for one subtest based on the sample selected for comparison. This one reading subtest showed such a large significant difference that its reliability was questioned in relation to the results of the other two reading subtests. The results of these comparisons for the senior high schools are presented in Tables 10 and 11.

IN-SERVICE TRAINING MATERIALS

The accomplishments of the research also produced feedback of information evolved from the workshops for Phase I and Phase II. These were materials developed by training leaders and staff participants who were to view their responsibilities as they were reflected in analyzing a series of tasks. They would act as the foundation for determining behavioral objectives and for demonstrating their relationships to education as described by the total curriculum design. Fifteen statements were presented to the trainees who drew up implications related to the statements. From these givens tenets for instruction were listed for each statement. They are stated in Table 12.

OBJECTIVE CRITIQUES BY CONSULTANTS

Tables 14 through 19 describe the critiques of the consultants after the completion of Phase I and Phase II with regard, primarily, to the quality of the behavioral objectives. With few exceptions they were of the opinion that the objectives were transmissible to professionally trained personnel, were of a sound educational quality, and gave evidence of balance between course objectives and their related discipline objectives in terms of content and cognitive process.

TABLE 10

COMPARISONS OF TWELFTH-GRADE STUDENTS AT ANDOVER AND LAHSER HIGH SCHOOLS WHO WERE TESTED IN OCTOBER 1966 AT ANDOVER BASED ON DATA OBTAINED FROM THE SCORES OF IOWA TESTS OF EDUCATIONAL DEVELOPMENT FORM X-4

	Andover		Lahser		
Test	Number	Adjusted Score	Number	Adjusted Score	Difference
Social Studies Background	198	56.35	151	55.44	Not Significant
Natural-Sciences Background	198	54.50	151	53.80	Not Significant
Correctness of Expression	198	54.67	151	54.29	Not Significant
Quantitative Thinking	198	56.45	151	55.48	Not Significant
Reading Social Studies	198	55.68	151	50.92	Significant
Reading - Natural Sciences	198	54.90	151	55.20	Not Significant

TABLE 11

COMPARISONS OF TWELFTH-GRADE STUDENTS AT ANDOVER AND LAHSER HIGH SCHOOLS WHO WERE TESTED IN OCTOBER 1966 AT ANDOVER BASED ON DATA OBTAINED FROM THE SCORES OF IOWA TESTS OF EDUCATIONAL DEVELOPMENT FORM X-4 (Cont'd)

Test	Number	Adjusted Score	Number	Adjusted Score	Difference
Reading-Literature	198	53.30	151	54.10	Not Significant
Vocabulary	198	58.05	151	57.26	Not Significant
Composite Tests 1 through 8	198	56.40	151	55.40	Significant
Use of Sources of Information	198	56.87	151	56.27	Not Significant

TABLE 11

COMPARISONS OF NINTH-GRADE STUDENTS AT BLOOMFIELD HILLS JUNIOR HIGH AND WEST HILLS JUNIOR HIGH WITH STUDENTS AT EAST HILLS JUNIOR HIGH WHO WERE TESTED IN OCTOBER 1966 AT EAST HILLS OR BLOOMFIELD HILLS JUNIOR HIGH, BASED ON DATA OBTAINED FROM THE SCORES OF IOWA TESTS OF BASIC SKILLS

Test	Number	Adjusted Score	Number	Adjusted Score	Number	Adjusted Score	Difference
Vocabulary	190	53.99	73	53.80	152	53.95	
				East Hills-West Hills			Not Significant
				East Hills- Bloomfield Hills Jr.			Not Significant
				West Hills - Bloomfield Hills Jr.			Not Significant
Reading	190	55.55	73	57.03	152	53.87	
				East Hills - West Hills			Not Significant
				East Hills- Bloomfield Hills Jr.			Significant
				West Hills - Bloomfield Hills Jr.			Significant
Language	190	52.45	73	52.48	152	51.00	
				East Hills - West Hills			Not Significant
				East Hills - Bloomfield Hills Jr.			Significant
				West Hills - Bloomfield Hills Jr.			Significant

TABLE 11

COMPARISONS OF NINTH-GRADE STUDENTS AT BLOOMFIELD HILLS JUNIOR HIGH AND WEST HILLS JUNIOR HIGH WITH STUDENTS AT EAST HILLS JUNIOR HIGH WHO WERE TESTED IN OCTOBER 1966 AT EAST HILLS OR BLOOMFIELD HILLS JUNIOR HIGH, BASED ON DATA OBTAINED FROM THE SCORES OF IOWA TESTS OF BASIC SKILLS (Cont'd)

Test	Number	Adjusted Score	Number	Adjusted Score	Number	Adjusted Score	Difference
Work-Study	190	57.01	73	57.15	152	57.51	
				East Hills - West Hills			Not Significant
				East Hills- Bloomfield Hills Jr.			Not Significant
				West Hills - Bloomfield Hills Jr.			Not Significant
Arithmetic	190	49.92	73	51.72	152	50.96	
				East Hills - West Hills			Significant
				East Hills - Bl. Hills Jr.			Not Significant
				West Hills - Bl. Hills Jr.			Not Significant
Composite	190	52.82	73	53.37	152	52.16	
				East Hills - West Hills			Not Significant
				East Hills -- Bl. Hills Jr.			Not Significant
				West Hills - Bl. Hills Jr.			Significant

TABLE 12

IMPLICATIONS AND INSTRUCTIONAL TASKS DRAWN FROM EDUCATIONAL STATEMENTS

STATEMENT 1:

THE LEARNER MUST HAVE AN ADEQUATE CONCEPT OF SELF IF HE IS TO SUCCEED; WITHOUT IT HE CANNOT EVEN TRY.

IMPLICATIONS:

1. The student needs success experiences.
2. The student needs to be helped to set realistic goals for himself.
3. The teacher must accept each child as he is in terms of his own needs, ability, present achievement, and potential.
4. Learning tasks must be suited to the current self-concept and ability of the learner.
5. The teacher must be able to distinguish between the student's concept level and reading level.
6. The teacher must provide multi-media, multi-level curriculum materials.
7. The teacher must try to discover what the student's self-concept is by providing experiences that will reveal this.
8. The teacher must help the parent understand and support the student and the goals and purposes of his program.
9. Adequate time must be provided for individual attention to be given.
10. Students must be given individual attention.

TASKS:

Curriculum realistic so child can succeed
Small enough to attain--meaningful (relevant)
Supportive
Child involved--active role in learning process
Allowance for choice
Variety of media
Child chooses how he does something.
Realistic objectives (meaningful)
Specific objectives
Needs to be related to his peer group experiences and his developmental stage
Allow flexible group activities and pupil-team learning
Interest grouping
Prerequisite: The teacher must be prepared (be able) to evaluate the child's self concepts.
Know how the child views himself
The teacher must be able to aid the learner to build a realistic self concept whether this concept be deficient or over-ambitious.

TABLE 12 (Cont'd.)

STATEMENT 2:

BEHAVIOR RESULTS FROM UNIQUE INDIVIDUAL PERCEPTION. BEHAVIOR IS THE RESPONSE OF AN ORGANISM TO NEW PROBLEM-SITUATIONS. PERCEPTIONS DEVELOP OUT OF THE INDIVIDUAL EXPERIENCES OF THE ORGANISM, AND HENCE ARE UNIQUE TO HIM.

IMPLICATIONS:

1. Not every student will react in the same manner to the same stimulus.
2. Teachers should not expect all learners to reach objectives by the same means (methods).
3. Teachers should provide a variety of experiences to reach each goal.
4. Evaluation procedures must also be multiple.
5. Learning style of student should be identified and an attempt made to match with appropriate teaching styles.
6. Writers of curriculum must create problem-situations.

TASKS:

If the individual perceives differently, the end product doesn't necessarily fit a mold.
It's important to preserve the uniqueness of the individual as much as possible within the guidelines of the program.
It is necessary to provide a variety of problems relating to the interests of the individual, within the guidelines of the program.
It's important for the teacher to strive to know how and what the student perceives.
Student should have opportunity to re-evaluate old problems in view of developed perceptions.
Curriculum should be what the student perceives as a problem for solution, having a choice from a wide variety of materials, methods, etc.
No "right" answers exist.
At the elementary level, children should be allowed freedom of interaction of ideas and opinions.
Children are not to be placed in conforming molds.
There should be student options for choosing objectives, methods, and media.
Problem-solving should begin in the early elementary years and should be reinforced.
The curriculum should begin with the child as he is and guide him toward greater performance.
Children should be informed as to what is expected.

TABLE 12 (Cont'd.)

STATEMENT 3.

EACH INDIVIDUAL IS UNIQUE, AND HE PERCEIVES IN TERMS OF HIS OWN EXPERIENTIAL BACKGROUND AND PRESENT PURPOSES.

IMPLICATIONS:

1. Each student perceives reality in his own way.
2. We must provide a choice of methods for achieving an objective.
3. We should become aware of experiences that make students individuals.
4. We should provide opportunities for students to relate to other individuals--teachers--groups.
5. Subject matter must be relevant to present interests of students.

TASKS:

Each child needs to be encouraged rather than discouraged.
Relate new experiences and learning with past experiences of the child.
Understand and encourage varying points of view.
Help and encourage the child to understand and know why he has his own point of view.
Encourage the child to realize that his ideas are important because he himself is important.
Encourage the child to apply his learning experiences in such a way as to survive in the society in which he lives.

TABLE 12 (Cont'd.)

STATEMENT 4:

EACH LEARNER IS UNIQUE; DIFFERENCES BETWEEN LEARNERS TEND TO INCREASE WITH EFFECTIVE LEARNING. INDIVIDUAL DIFFERENCES ARE NATURAL, NORMAL, AND IMPOSSIBLE TO ELIMINATE.

IMPLICATIONS:

See the first set under Statement 1. Implications are the same but with greater emphasis.

TASKS:

Tasks fit individual.
Tasks meaningful for the individual
Resources different for different individuals
Provide for a variety of learning settings
    Variety of assignments and evaluations
    Variety of teaching methods
The student must accept and understand his own uniqueness as a positive force.
The student must learn to use his special abilities (individual differences) to relate and contribute to a group and to his own learning process.

TABLE 12 (Cont'd.)

STATEMENT 5:

THE PUPIL LEARNS AS A TOTAL ORGANISM; HE CANNOT DIVIDE HIMSELF INTO SEPARATE SUBJECT DISCIPLINES AS THE SCHOOL IS OFTEN DIVIDED.

IMPLICATIONS:

1. There are common elements that cross discipline lines.
2. More inter-disciplinary co-operation and understanding in the design and implementation of the curriculum is implied.

TASKS:

The subjects should be interrelated rather than divided into specific disciplines.

The communication and inquiry skills are the basis of all learning.

Change of wording:

Each teacher should be responsible for the full education of the child and not limited to just his own subject area; reinforcement is essential to learning regardless of the specific discipline.

Students should be task-oriented and disciplines used as needed in performance of task completion.

We question the assumption.

TABLE 12 (Cont'd.)

STATEMENT 6:

SUBJECT MATTER SHOULD EVOLVE FROM MEANINGFUL, PROBLEM-SOLVING ACTIVITIES RATHER THAN FROM FRAGMENTS OR PARCELS OF SUBJECT AREA DISCIPLINES.

IMPLICATIONS:

1. The thinking process is primary. Subject matter should be the vehicle.
2. The student should see a purpose in everything he does whenever possible.
3. Meaningful problem-solving means that there are various levels of interest and ability levels.

TASKS:

Help the child relate abstract problems to the practical world in which he lives.

The child must be aware of his goals in a realistic manner. In other words, the child must be able to see where he is headed.

The child should realize how he will attain his goal.

The child should be assisted in reaching his goals through a series of successful experiences.

TABLE 12 (Cont'd.)

STATEMENT 7:

SUBJECT MATTER IS BEST UTILIZED WHEN THE LEARNER PERCEIVES IT AS FUNCTIONAL TO THE SOLVING OF PROBLEMS HE HAS FORMULATED.

IMPLICATIONS:

1. The teacher must encourage the learner to formulate his own problems or questions.
2. The teacher must discover the student's current level of inquiry and problem-solving skills and provide experiences in those needed.
3. The teacher must discover what problems seem relevant to the learner and help the learner recognize these.
4. The student must have an opportunity to select some of the problems or projects he will work on.
5. Opportunities (and materials) must be available for students when they are ready for specific experiences.

TASKS:

Aware of objectives
Provide variety--choice--student contract (methods of meeting objectives)
Participate in learning
Deal with his peer group's experiences
Interest areas
Help in identification of his problems and how they relate to the curriculum
Make curriculum relevant to the student's world
Opportunities to apply knowledge and skills--application part of learning process
Reinforcement of skills
The teacher's role is to aid the learner to see functional relationships between subject matter and his own everyday problems.

TABLE 12 (Cont'd.)

STATEMENT 8:

CONCEPT DEVELOPMENT PROCEEDS FROM THE CONCRETE AND THE ABSOLUTE TO THE MORE ABSTRACT AND MORE RELATIVE.

IMPLICATIONS:

1. Experiences must be provided which cover the spectrum (concrete to abstract and absolute to relative).

TASKS:

In writing curriculum we should recognize that students must begin and work on the concrete level in a variety of ways to cover the needs of the individual.
It is important to move the child along from the concrete to the more abstract as quickly as possible.
There are various degrees to which each child is able to abstract.
In presenting materials, it must be relevant to the student.
Applies to any learning situation
Concrete to abstract thinking processes vary for individuals.

TABLE 12 (Cont'd.)

STATEMENT 9:

LEARNING IS ESSENTIALLY A PROCESS OF PROBLEM-SOLVING AT PROGRESSIVELY HIGHER LEVELS. KNOWLEDGE OF FACTS IS A MEANS TO THIS PURPOSE OF SOLVING PROBLEMS; IT CANNOT BE JUSTIFIED AS AN END IN ITSELF.

IMPLICATIONS:

1. We are not teaching for the sake of facts. Problem solving is the main thing.
2. We must be aware of where each student is on the level of progression--of what each student can do.
3. Facts selected should be relevant to the problem.

TASKS:

The knowledge or subject being taught is merely a tool in building a value system for the child.
Give the child a variety of learning experiences which are directed toward understanding of a particular value.

TABLE 12 (Cont'd.)

STATEMENT 10.

EACH CHILD SHOULD BE MORE CONCERNED WITH THE PROCESS OF SOLVING PROBLEMS THAN WITH FINDING THE RIGHT ANSWER TO THE PROBLEM

IMPLICATIONS:

1. Evaluation instruments should be designed to measure skill/progress in the problem-solving process rather than merely the final answer.
2. Learners should be encouraged to seek information independently rather than having teachers supply information.
3. Learners should be encouraged to ask questions and encouraged to defend their answers even though different from those accepted by other students and teachers.

TASKS:

Concentrate on the process rather than the end result.
Teach skills not content.
Evaluate skills not information.
Discover--learn by experience; experiment.
Teach variety of methods of problem-solving.
Reasons supporting process are more important than the end result.
The skill (thought process) is more important than the acquisition of specific factual knowledge.

TABLE 12 (Cont'd.)

STATEMENT 11:

STUDENTS CANNOT ASSUME RESPONSIBILITY IN LEARNING UNLESS THEY CAN SEE A PURPOSE FOR THE LEARNING.

IMPLICATIONS:

1. Goals should be clearly stated in student terms.
2. Students should be allowed a voice in determining these goals.

TASKS:

It must have a purpose in terms of the society as well as a purpose for the individual alone.
Students must see where they are going and why this direction.
When the student fails to see a purpose, the teacher must strive to help the student find a purpose acceptable to the student.
Change of wording
Students usually do not assume responsibility in learning unless they can see a purpose for the learning.
Against

TABLE 12 (Cont'd.)

STATEMENT 12:

TEACHERS WHO IGNORE THE PURPOSES OF THE LEARNER ARE DESTROYING MOTIVATION.

IMPLICATIONS:

1. The learner has a purpose.
2. The teacher should discover and help students to be aware of their purposes.
3. Purposes motivate students.
4. Teachers should cater to purposes. This will intensify motivation.
5. Failure to do this will "turn off" students.

TASKS:

The teacher needs to understand how much the child already knows.
The teacher needs to realize what the child needs .
When the individual needs and purposes of the child cannot be met, explanations should be made so that both the teacher and the child understand why.

Must recognize and define operant factors
    (A) Teacher's concept of
        child's purpose
    (B) "Purpose"
    (C) Child's concept of
        his purpose (statement 3).
A, B, C operate, interact
Multiply by number of individuals
Factors must be meaningfully and honestly reconciled for motivation activation.
How (methods-tasks) must be found.
Create problem situations (discrepancies) that cause him to ask questions because they relate to his purposes
An individualized program
Finding his purposes
Find your purpose
Statement 6
Statement 9 - what you teach - to solve problems that arise furthering own purpose

TABLE 12 (Cont'd.)

STATEMENT 13:

CREATIVE AND PRODUCTIVE LEARNING EXPERIENCES INVOLVE SELF-EVALUATION.

IMPLICATIONS:

1. The student must learn to evaluate himself in terms of his own goals and in terms of external standards (which he perceives as meaningful to him).
2. Opportunities must be given for students to be exposed to a variety of experiences and to accept or reject after reasonable exposure, giving his reasons for his decisions.
3. Students must learn to experience less than complete success without being defeated by it.

TASKS:

Evaluation on self-progress not group progress provides motivation for self-evaluation --

give self-confidence,
success experiences,
show personal growth,
supportive.

Individual conferences

The learner must involve himself in setting up achievement goals, deciding how to accomplish them, and determining if they have been fulfilled according to his individual needs.

TABLE 12 (Cont'd.)

STATEMENT 14:

ALL THE VARIOUS FORMS OF "HOMOGENEOUS" GROUPING EVER USED HAVE DEMONSTRATED (1) THAT CHILDREN DO NOT LEARN MORE IN SUCH GROUPS AND (2) THAT THE RANGE OF LEARNING DIFFERENCES WITHIN THE GROUP IS NOT REDUCED BY A SIGNIFICANT EXTENT.

IMPLICATIONS:

1. P. E. classes should be co-educational.
2. Regardless of grouping, materials, methods, and experiences must be addressed to the individual.
3. Homogeneous--Do you mean ability grouping or ____________?

TASKS:

We should have heterogeneous grouping.

TABLE 12 (Cont'd.)

STATEMENT 15:

THE USE OF RIGID GRADE LEVEL STANDARDS IS INVALID, INEFFECTIVE, AND A DETERRENT TO LEARNING.

IMPLICATIONS:

1. Skills are not constant in all areas.
2. Interest is not constant in all areas.
3. If a student performs according to his own ability, he should be graded accordingly.

TASKS:

The program of study must be flexible so that the needs of the child can be met.
Method to avoid--desirous that the purposes are unique.

PARTICIPANT SURVEY FOR STUDY

Finally, to assess the contributions of participants in the study, a questionnaire was administered at the close of Phase II. As assembled in the following table, the data presented a positive picture of the procedures for completing the research, particularly in the areas of group function and project productivity.

TABLE 13

PARTICIPANT RESPONSES TO RATING QUESTIONNAIRE
N = 62

Activity	Yes	No
The overall study was productive.	56	5
The group sessions at the beginning of the study were very good.	37	12
The orientation sessions would have fulfilled their purpose better if they had been organized vertically around disciplines.	16	23
The orientation sessions would have fulfilled their purpose better if they had been grouped by grade levels that cut across subject - matter lines.	17	32
The roles of the group leaders are helpful.	41	3
The role of the Project Director is helpful.	53	3
The individual groups functioned well.	48	14
A continuous - progress curriculum council would serve a useful function for updating and upgrading the curriculum.	50	3
More intensive assistance should be provided for each group in beginning the project.	46	7
Work periods should be organized for fewer days per week and for a longer period of time.	8	44

Activity	Yes	No
Workshops should run for a greater number of weeks with a break in the middle.	10	44
Workshops should be organized on a preprogrammed basis so that various specialists could meet with the groups on a regular basis.	52	6

According to the findings of the consultants studying the results of the project for Phase II, recommended revisions and/or additions are categorized in the following tables given for the objectives in the research proposal. Behavioral objectives accepted as stated have not been included in the enumeration.

RECOMMENDATIONS

FINDINGS REFLECTED IN THE ANALYSES OF DATA BY THE CONSULTANTS

Consultants were brought in to the research operation at the completion of Phase I and again at the completion of Phase II of the study. They were expected to evaluate the data collected to date and make recommendations for later revisions and additions with respect to the performance specifications.

At the terminating point for Phase II a consultant-orientation workshop was held at Holiday Inn, Southfield, Michigan. The agenda was made up of features introducing Bloomfield Hills personnel to the consultants and preparing the consultants with the skills necessary to fulfill the objectives of their tasks.

Tentative Work Session

9:00 a.m. - 3:30 p.m. April 25, 1970

Welcome	E. L. Johnson, Superintendent Bloomfield Hills, Michigan
	Mrs. Carter Chamberlain, President Bloomfield Hills Board of Education
Orientation to Bloomfield Hills Curriculum Design	Dr. Robert E. Boston Assistant Superintendent

Dr. Boston described the components of the design for the continuous-progress curriculum to individualize instruction. By means of visuals he explained the interrelationships among the facets of the curriculum and emphasized the functions of the behavioral objectives and their role in the instructional and organizational system of the district. In conclusion he dwelt upon the plans, hopes, and anticipated developments for constructing relevant criteria and finalizing a justifiable evaluation of the design and implementation of this innovative curriculum.

Responsibilities of Consultants	Marilynn S. Wendt Director of Curriculum

Miss Wendt told the consultants what their tasks would be, restated the research objectives as accepted by the U.S. Office of Education and redefined, in specific detail, the limitations of the resultants within the periphery of the following interpretive data of this continuous-progress curriculum:

1. Philosophy
2. Action Words
3. Cognitive Processes
4. Hierarchy of Objectives
5. System Objectives
6. Discipline Objectives

Group Meetings by Subject Area with Bloomfield Hills Personnel

Dr. Frank Lanham, Wayne State University, and Betty Leavitt, teacher at Lahser High School, for Business Education

Dr. Robert Trezise, State Department of Education, Dr. Robert Fichtenau, Oakland Schools, and Elsie Erkfitz, Communication-Skills Coordinator, for English and Communication Skills

Barbara Ort, State Department of Education, and Dr. Marjory E. Jacobson, System Coordinator, for Foreign Language

Fred Ioanou, Wayne State University, and Miss Wendt

Dr. Joseph Arnold, Ohio State University, and Roy Monzo, teacher at Lahser High School, for Industrial-Arts Education

Dr. David Wells and Dr. Albert Shulte, Oakland Schools, and Roy Thompson, Mathematics Coordinator, for Mathematics

Dr. Lee Haslinger, Pontiac Schools, and Norman Quinn, Director of Physical Education, for Health, Recreation, and Physical Education

Dr. James Beaird, Teaching (Behaviorist) Center, Monmouth, Oregon, and Stephen Velkoff, Science Coordinator, for Science.

Total Group Question-and-Answer Session

For the consultants who were not able to attend this workshop additional workshops were conducted at their convenience. Those who did not attend the general workshop were Dr. Mary Rouse, Indiana University, Art Consultant; Dr. Robert Klotman, Indiana University, Music Consultant; Dr. Ruth Midjaas, Oakland Schools, Home Economics Consultant; and Dr. Neille Shoomaker , Humanities Center, Berea, Ohio, Humanities Consultant.

Two specialists in the behavioral sciences: Dr. Bruce Tuckman, Rutgers University and Mr. Ioanou were also assigned the responsibility of assessing the performance specifications which reflect the cognitive processes of the objectives.

SUBJECTIVE CRITIQUES AND RECOMMENDATIONS BY CONSULTANTS

Tables 14 and 15 were designed to present the subjective views of the consultants. They critiqued, not only the behavioral objectives, but the setting for these objectives in a curriculum individualizing instruction. In addition directives were recommended by the consultants for completing the research program of the present project and identifying options for further research proposals.

OBJECTIVE RECOMMENDATIONS BY CONSULTANTS

To demonstrate the extent to which the composite of behavioral objectives have met the prescribed criteria, as predetermined in planning the research design, Tables 16 through 19 tabulate separately the appropriate data reported by the subject-matter specialists and by the behaviorists. These tabulations will serve, in essence, as guidelines for an additional field test of the objectives.

TABLE 14
PRELIMINARY FINDINGS OF CONSULTANTS
Phase I

Consultant(s)	Critique	Recommendations
Richard J. Shupe, Distributive and Office Education, Michigan Department of Education Business Education Curriculum	1. Yeoman effort has been exerted to develop an innovative system. 2. Dedication and commitment to the project were obvious from discussions with staff members and coordinators. 3. You have identified the type of project absolutely essential to continue to expand the concept and then test by means of appropriate research. 4. For meeting the child's educational needs on an individual basis, what I observed in Bloomfield puts theory into practice.	1. Additional types of vocational courses within the business-education curriculum might very well be expanded to provide for additional experiences for high-school youth interested in entry and career-development jobs upon completion of high school. 2. Utilization of the systems approach to these advanced types of courses and units will give greater scope and depth to the office and distributive education programs.
Dr. Robert Trezise, Humanities & Social Studies, Michigan Department of Education Humanities Curriculum--Social Science and English	1. Michigan Department of Education considers this program to be one of the most interesting and important innovative educational plans in the state of Michigan -- and possibly in the entire country. 2. This is the only program in Michigan dealing with the most basic problems of curriculum on such a broad scale (K-12) and in all curriculum areas.	1. There are questions to be answered about some of the procedures of the program.

Consultant(s)	Critique	Recommendations
Dr. Robert Trezise (Cont.)	3. Through the extraordinary efforts of a highly competent staff of administrators and teachers, the Continuous-Progress Program has developed from a sound (though highly complex) theoretical base. 4. The project people have managed to move the program out of the paper stage and into actual practice with children from the kindergarten through twelfth-grade level. 5. As elegant as the experimental design for this program is, it is the fact that it is in operation that we have found most impressive. 6. We have been impressed with the scope of the program, the depth of the planning that has gone into it, the zeal of the staff involved with the program, and the importance and relevance of the questions concerning curriculum to which these people have addressed themselves. 7. In the pursuit of their purposes, in their careful definition of both the theoretical and procedural elements of the program, and in their scrupulousness in defining and ordering behavioral objectives, there is	

Consultant(s)	Critique	Recommendations
Dr. Robert Trezise (Cont.)	no question that the Bloomfield Hills people have made impressive progress indeed over the past year that we here in the Department have been involved.	
Barbara Ort, Foreign Language, Michigan Department of Education French, German and Spanish	1. You are going in a very needed direction. 2. The programs (observed) seem to indicate a valid attempt to implement behavioral objectives into the curriculum. 3. The foreign-language staff is making progress.	1. Terminal-and interim-performance objectives have not been completely defined in separate terms to be evaluated independently.
Arthur Hansen, Assistant Supervisor of Trade and Industrial Education, Michigan Department of Education Industrial Arts Curriculum	1. The overall objectives of the program are being met, particularly by those teachers who have been with the project from its initial stages. 2. Roy Monzo, teacher at Lahser, is to be commended on the instructional materials he has prepared and his understanding of the objectives for Industrial Arts Education. 3. I like the individualization found in the program. 4. Mr. Monzo was fortunate to have two assistants during our visitation. This improves the safety factor making it possible to have no more students under his guidance at any one time than can be readily observed.	1. This program requires extensive daily preparation by the teacher, cooperation with other disciplines, and, hence, much record keeping. The task of material preparation in subject areas could be minimized by making direct reference to good commercial materials rather than by doing much rewriting. 2. These materials could be cross-referenced and save much time in preparation. 3. The individualization of instruction should be examined to make sure students are not locked in, thus removing some of the advantages of individualizing instruction. It is still very important to have group discussion and demonstration to overcome misinterpretation,

Consultant(s)	Critique	Recommendations
Arthur Hansen (Cont.)	5. There is clarity in the overall objective of the program. 6. Materials developed in the several subject areas in industrial education are limited, but demonstrated the same quality as for the overall objective.	4. An exploration should be made for one element in tool and equipment usage. Time should be provided for the instructor to make sure a student not only has a tool properly ground for the job, but the technique of handling is demonstrated.
Edwin G. Rice, Coordinator, Health, Phys. Ed. & Outdoor Education, Michigan Department of Education Physical Education Curriculum	1. All minimum standards for all program objectives are realistic. 2. All time factors for all program objectives are realistic. 3. Whether or not objectives should be eliminated is regarded to be a matter of local determination. 4. Sequence appears to be logical in nature. 5. There are no commercial objectives. 6. All materials have been developed by teachers. 7. Strategy procedures appear to be in appropriate sequence. 8. All tests observed appear to meet needs of the objectives. 9. All post-tests appear to meet needs of determined objectives. 10. All proposed courses have prerequisites. 11. Bloomfield Hills has made a breakthrough with innovative practices and procedures in the physical-education program.	1. Bloomfield Hills should develop a project for funding which gives strong visibility to the physical-education area with the school center serving as a demonstration center or pilot program. 2. It is believed that the school districts in Michigan as well as out-of-state communities, could profit tremendously from planned visitations for observing the Bloomfield Hills physical-education program.

Consultant(s)	Critique	Recommendations
Marguerite E. Lofink, Home Economics Education, Michigan Department of Education Design, Family Living and Clothing Selection Courses	1. The detailed plan for the project is most interesting.	1. At Lahser High School there are expectations to expand the home-economics program to relate it more closely with some of the emerging occupational programs. 2. The teacher will plan to have more materials prepared in the area of interior decoration.
Dr. Jack Bratton and Dr. Fred Bennik, Systems Development Corporation, Santa Monica, California Instructional-Management System	1. It appears to be already generally recognized that Bloomfield Hills is among the half-dozen or so outstanding school districts in the United States.	1. It is time for your project to shift its emphasis in order to keep the development of individualization equalized across the system. The following suggestions are based on these premises and are offered as ideas about how this might be done. 2. At SDC we refer to the procedures for using individualized instructional materials as instructional management. There is no reason to believe that this particular version of an instructional-management system would be valuable for Bloomfield Hills. 3. The process of developing an IMS for Bloomfield Hills probably ought to begin at about the level illustrated by the flow diagram labelled Enclosure C.[1] The crux of the instructional-management problem is to identify the decisions that the school staff

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[1] Appendix F, p. 332.

Consultant(s)	Critique	Recommendations
Dr. Jack Bratton and Dr. Fred Bennik (Cont.)		must make in order to manage instruction. The specification of decisions such as these that are appropriate to the management of instruction is not a simple matter. Asking teachers and administrators to provide the specifications is usually not fruitful because they tend to view their decisions as having self-evident validity and are not sensitive to the use of data to increase validity. 4. I further believe that we must be sufficiently convinced of the value of individualization that we are willing to focus on the current real problems of a school, such as attendance, morale, etc., and view the technology of behavioral objectives, etc. as means to improve the performance of the school.

TABLE 15
TERMINAL FINDINGS OF CONSULTANTS
PHASE II

Consultant(s)	Critique	Recommendations
Dr. Robert L. Trezise American Literature	Every course outline should have a certain standardized organizational pattern. "American Literature"course: Too much emphasis seems to be placed on the analytical approach to the works studied. The course objectives seem to ignore completely the "new" approach to literature, which stresses much more simply encouraging youngsters to read and talk freely about books in terms of their own experiences and their own perceptions. Terms used in the course outline are typically "English-teacher terms" which are devices to be given minor considerations in talking about books. It is difficult to understand the meaning of "the interaction between the speaker, audience and occasion within a selection or portion of a selection" as the definition of the dramatic situation. The types of character need to be more fully defined and I would question the terms. Asterisks are not explained by footnotes "Interpretive elements" should be defined. Repetition tends to dull sharp meaning because the lull of the words begins to carry its own rhythm -- and in the direction away from understanding. There is too little	You are to be commended on this outstanding project. I don't know of another district that has tackled as many of the most basic questions in curriculum on the scope you have in Bloomfield Hills. It has been a really exciting project. I commend the designers for their skill in picking out the TPO's and the IPO's which seem to be appropriate for the CO's.

Consultant(s)	Critique	Recommendations
Dr. Robert L. Trezise (Cont.)	clearly defined relationship between the activities and the CO's.	
Basic Composition	"Basic Composition" course: The course objectives do not appear to be specifically defined and described. It would be important to give the reader a clear idea of the order of the course and relieve the confusion between the TPO's and the CO's. There is too much emphasis on mechanical errors in the general writing processes covered in this course.	There should be a stress on the importance of evaluating youngsters writing in terms of the whole and in terms of the positive aspects.
High-School Composition	"High-School Composition" course: The organization of this course is much better than the basic composition, based upon a sounder rationale. CO's are stated clearly and specifically, and reference is made in each case to the TPO involved in carrying out these course objectives. The objectives do little to help a teacher carry the students forward in a study of various writing categories. A fairly simple task is obfuscated by the terminology. In some cases, the "100% accuracy" idea does not seem feasible.	Mention should be made of the joy of open and free communication through the writing processes. There should be a great deal of attention paid to writing coherence, documented statements and balance between the various parts.
Communication Media	"Communication Media" course: The course syllabus is clearly presented; the CO's are listed clearly at the beginning; and these are followed by a clear statement of the TPO's and the IPO's.	Comparisons of newspapers should be considered, including some study of the liberal-conservative continuum. Students should have some idea of how a newspaper works. The course

Consultant(s)	Critique	Recommendations
Dr. Robert L. Trezise (Cont.)	The activities are related to the CO's with a clear presentation of suggested times to be spent or the various CO's. This course focusses mainly on skills and lends itself easily to a behavioral description. One element I think is good is the recognition of the fact that the categories and various terms used are inexact ones -- and there is always a good deal of overlap.	should include some mention and study of the underground press as it exists on both high school and college campuses. The course should make students aware of great books in journalism. Media -- other than the press -- could just as well be eliminated.
World Literature	"World Literature" course: The entire course seems to neglect completely the affective response to literature in favor of the analytic. Meanings of the terminology for the direction to "state rules for constructing classification of the various forms" and to "demonstrate procedures for constructing a classification" are unclear.	
Shakespeare	"Shakespeare" course: CO2, comparing the Elizabethan era with today's era looks interesting.	The TPO's for the course should be identified. The students should experience the plays not only in a total way but as a part of a group. This course might be more appropriate as the kind of study that might follow a course dealing with the plays themselves in a total way rather than the playwright's craft as a playwright.
Creative Writing	"Creative Writing" course: Nearly everything is approached in an atomistic, methodical, highly	If the behavioral objectives are to be used by teachers, then the nature of the task must be

Consultant(s)	Critique	Recommendations
Dr. Robert L. Trezise (Cont.)	structured way. The CO's are ingenious. The CO expansions are fine.	much more clearly defined.
	Considering the nature of the modern short story, I would question the approach suggested here.	Included should be books about the creative process and about the great creative writers.
Dr. Joseph P. Arnold Industrial Arts Curriculum Project *Ohio State University* Overview	Mr. Monzo has taken the materials a long way and he should be complimented for it. Nearly complete concentration on a single text is evident. It is not clear which of the courses are individual courses, grade-level courses, and/or courses in sequence.	The materials still need: 1. Adoption of a consistent format of presentation across the various areas within industrial education, 2. Expansion to include objectives which apply and emphasize integration of different concepts and individual learnings: this implies a slight lessening of emphasis on manipulative skills, 3. Consideration of additional areas at both high school and junior-high levels such as electricity, manufacturing, and construction.
Architectural Drafting	Architectural Drafting: There is a problem of classification of the objectives. The basic drafting skills should have a separate heading and section.	There should be support and planning for a summer workshop in key subject areas in the vocational-education program.
Introduction to Architecture	Introduction to Architecture: In some instances IPO's are not stated in behavioral terms. Test questions are not traceable to an objective and each objective does not always have adequate representation in the test.	A description of the overall course structure, sequence, and time allotments would clarify which of these are individual courses, the grade level, and the sequence.

Consultant(s)	Critique	Recommendations
Dr. Joseph P. Arnold (Cont.) Engineering Graphics	Engineering Graphics: The inclusion of "a classification of" tends to overcomplicate the objective. The factor of basic differences in your taxonomy may need attention throughout most of the IPO's in Industrial Education. I suggest deletion of most actual gear drawing; thread drawing is also of questionable importance. Use of T-squares is rather cumbersome and obsolescent. There is no objective relating to the use of print machines and lettering devices.	Freehand sketching should be included as a tool in problem solving. It would be appropriate to convert from the use of T-squares to rule boards and drafting machines. There should be a reflection of functions and principles in the objectives.
Fluid Power	Fluid Power: I found a great deal of difficulty in following the numerical coding of objectives in this section.	There should be some objectives relating to safety and accident prevention, possibly with each circuit hook-up or other learning activity.
Arc Welding	Arc Welding: There is no inclusion of objectives relating to the application, use and relative importance of welding as a fastening method.	The three units on welding would probably best be put together into one integrated course or unit and include other methods of fastening.
Other	Comments for other courses were similar.	

Consultant(s)	Critique	Recommendations
Dr. Robert Klotman Chairman of Music Education Department, Indiana University General Music Choral Music Band-Techniques Course	I question the per cent figures because there was no reference as to how they were determined. It is questionable whether the skills of proper singing techniques should become objectives for younger students. I am increasingly aware of a lack of concern for a variety of "musics"; too much of the orientation is based on skills rather than musicality. There is a basic misunderstanding in the sequential development of the band objectives, the rhythmic figures compound the difficulties arising from more difficult key signatures. Your basic idea is good. Do not pattern your objectives after the Seashore Test for which the validity is questionable. There has been no effort at melodic "Interpretation."	In General Music, I would recommend beginning with the brass, woodwinds next, and then strings because it is easier to identify the brass then the others. Melodic interpretation should be included. We must design something for the affective as well as the cognitive domain. Sight singing and theory should be included for wind players as it is for string players. There should be recognition that the two most recent developments in music education are: (1) Comprehensive musicianship and (2) Music that represents examples from the plurality of people that make up our nation. Electronic music labs and computer music should be explored to keep abreast of current thought.
String-Techniques Course	The objectives for String Techniques are stated in realistic terms; they convey a measure of musical judgment.	

Consultant(s)	Critique	Recommendations
Dr. Robert Klotman (Cont.) Concluding Observations	This is a magnificent attempt to systematize instruction. It is the first effort that I have seen in school music and you are to be congratulated. There are too few "interpretive" objectives, particularly instrumental. There is limited reference to analysis of the three components of CMP: (1) Performing sounds, including ability to improvise, (2) Analysis of musical intent, (3) Organization of sounds. There is practically no improvisation or creative writing.	
Dr. Lee W. Haslinger Director of Physical Education and Health Education, Pontiac, Michigan, Public Schools Overview Folk Dance/ Modern Dance	I find the content skill sequences well thought out. I believe in the idea of course objectives but the 1.1 through 1.5 objectives for each Content Skill are difficult to grasp. You have been very thorough in your physical skills sequence.	I suggest that you combine the physical-skill chapter and the content-skill chapter. The measurable objectives or performance standards can be directly related. It seems that Folk Dance/Modern Dance skills should appear as "Movement or Basic Skills and only when there is an attempt to control quality or to add specified combinations to rhythm should they be classified as Folk Dance or Modern Dance.

Consultant(s)	Critique	Recommendations
Dr. Lee W. Haslinger (Cont.)	You are getting to the idea of relating measurable objectives or performance standards in your section describing Method and Media for Basic Skills. This begins to sharpen up the process for the teacher. You have done a good job.	In the early grades the activities should be planned to provide experiences and practice in a wide variety of movement skills. Then, later, we can become concerned with efficiency of movement.
Dr. Mary J. Rouse Indiana University Overview Art I	My criticisms are rather minor, on the whole. However, they should be regarded as details which can be altered rather quickly or added to what has been done. There is very little that I would want to delete. I wish to compliment the writers of this curriculum as a whole. It is extremely well done and systematically organized in a way that I have not seen in any other school district. All of you, your School Board, and the Office of Education should be congratulated on your efforts. The curriculum as a whole does quite well with the TPO's, ADO 1.0, etc., relative to working with the elements and principles	Your project should serve as a model for other school districts to follow. I hope it can be given the publicity it deserves. It seems to me important that the student should be required to deal with all the design elements and certainly some of the more important principles, rather than permitted to select only a few in Art I.

Consultant(s)	Critique	Recommendations
Dr. Mary J. Rouse (Cont.)	of design, but does very little with those relating to philosophy and man's expressions and visual communication skills. The current emphasis in art education is now on those objectives classified under philosophy and man's expressions.	
Art I -- 7th and 8th Grade	For Seventh- and Eighth-Grade Art I am not certain that the students will have had the necessary prerequisite work in the "design elements" to insure that they have enough knowledge to use "pieces to exhibit uniqueness and studied design elements" as a criterion at this point.	
	The principles of design: unity, harmony, rhythm, continuity, etc., can give some basis to make aesthetic decisions, a descriptive language with which to talk about art objects and/or their parts, but gives them no basis for making abstract relational judgments.	
Art II	The wording of TPO's 2.0, 3.0, and 7.0 for Art II seems enormously involved and convoluted to a degree not really needed.	

Consultant(s)	Critique	Recommendations
Dr. Mary J. Rouse (Cont.)	Relationship between process and making a painting not at all clear. Painting probably ought to deal with more than one element. Basic processes needing few technical skills should come earlier before the more technical processes already described.	Objectives are very well stated.
Dr. Robert L. Fichtenau Director of English Oakland Schools Communication Skills	Most of the objectives for the Elementary Communication Skills and the original set of objectives are quite good. The "writing skills" objectives appear to neglect several of the skills basic to the writing process.	Through a study of the process a professional writer follows, one is able to identify the basic skills to determine what a student has to say and how he can say it more efficiently. I suggest that identification of the voice or stance the author adopts is another worthwhile skill in addition to identification of purpose for reading objectives.
Barbara Ort Foreign Language Consultant Michigan Department of Education French I	There is very little room to argue with the structure of the objectives (French). A teacher faced with objectives which are grammar oriented could completely ignore the whole field of area studies and culture. There should be a much greater control of vocabulary, not only what nouns	

Consultant(s)	Critique	Recommendations
Barbara Ort (Cont.)	are to be learned, but how many.	
	Due to the categorization of grammar points it is very difficult for a teacher to see the interrelationships between various types of structure.	
Spanish I	Spanish I objectives seem to present the most complete package at the present time.	
	There is too great an emphasis on reading and writing skills in Spanish I.	Even though the content of the Spanish I units is quite culturally oriented, it is important to have objectives which can be measured related to this skill.
Dr. Ruth E. Midjaas Consultant, Vocational Education Oakland Schools Clothing Construction -- 7th Grade	Clothing Construction -- 7th Grade: It is necessary to identify common equipment needed for a seventh-grade clothing project rather than to classify serving equipment, compare and contrast items or describe relationships between and among machines.	Work in identifying and describing all fibers might be postponed to a later grade level. Preparation of the student in the skills to achieve maximum utilization of his clothing resources within the framework of his own values and goals should certainly be included in a clothing program.
8th Grade	IPO 1 is a well-written objective but CO 5 should be rewritten in order for the student to interpret guide sheets. CO 6 is an excellent objective; however, an accuracy of less than 100% might be suggested. For CO 10 the IPO's are good but, for this objec-	It is recommended that the thrust of future curriculum-development efforts should be toward exploratory home-economic courses for seventh and/or eighth grade(s). The course should include exploration of all areas of home economics with particular emphasis on areas other than foods and clothing.

Consultant(s)	Critique	Recommendations
Dr. Ruth Midjaas (Cont.)	tive, the level of accuracy is unclear.	It is further recommended that a ninth-grade comprehensive course be developed within the framework of the State Department of Education guidelines.
	"To demonstrate procedures for constructing a predict ion" is too difficult a thought process for slow students. TPO4 and TPO5 are very good.	There should be time to compare and contrast American subcultures concerning courtship and marriage customs, laws, etc., and the American Culture with other cultures in these respects. To teach ideal spending patterns, emphasis needs to be placed on decision-making. Consumer education should be much more than comparison shopping. Recommended additions: Personal relationships Family relationships Sex education -- Is this included in TPO1? Personality Roles of family members -- emphasize dual role of women; life goals Etiquette and hospitality Citizenship responsibility Managing the home Storage management Time management -- include management of leisure time Energy management
Dr. Neille Shoemaker Chairman of the Humanities Division Baldwin Wallace College	I was very much impressed with what you are doing. Let me congratulate you and others for developing a fine program in the	My first suggestion would be to see if there is adequate relationship between your statement on the philosophy of education and the programs as you have designed them.

Consultant(s)	Critique	Recommendations
Dr. Neille Shoemaker (Cont.) Humanities Overview	Humanities. You are also to be congratulated on putting together a fine body of materials to support the program.	One of your objectives should relate to maximum student participation and involvement.
7th Grade	I like your statement on the philosophy of education. I do not see, however, a clear use of this philosophy in the many objectives listed in the several programs. My first observation regarding the objective of the seventh-grade Humanities is that the objectives are hardly objectives; instead they are work assignments and very excellent ones at that.	If the 26 points of seventh-grade Humanities are kept, you might consider prefacing them with a short list of objectives, aims, and goals of the course. These could deal with what you wish the course to accomplish and what you hope the course will do for the students.
European Studies	Too many objectives tend to de-focalize a course. I merely raise a question as to whether there are too many separate listings and much fragmentation of some of the items under the objectives. Student evaluations will indicate whether they were troubled by too many objectives or not.	It would be a good idea to reorganize the three sets of major objectives for European Studies. I would keep the material under II but would not label it Major Objectives. Then, secondly, I would combine the objectives listed under I and III and merely have one set of objectives.
Elementary	There are too many objectives for second-third, fourth-fifth, and sixth-grade Humanities which I don't consider objectives at all but rather class assignments and procedures.	Prepare a short list of four or five things which you hope to accomplish in the course of Elementary Humanities; these would be the objectives.

Consultant(s)	Critique	Recommendations
Dr. Neille Shoemaker (Cont.) 8th and 9th Grade	The eighth-and ninth-grade Humanities courses are well put together, clearly outlined, well documented, have excellent guides, outlines, study materials, resources, and the like. The wealth of the material clearly supports the many objectives and assignments. I would make the same point as previously, namely, the objectives are not objectives as I see them. There are too many so-called objectives and each part has too many subheads.	
Dr. Bruce Tuckman Rutgers University Mathematics Overview	Overall, your mathematics objectives are in excellent shape. In no instance did I find even one that didn't adhere to Mager's four components. The objectives having the greatest problem with clarity were those that used the phrase, "describe the relationship between." Another area of criticism concerns the "how" for establishing accuracy criteria. It is interesting to note that in the earlier grade levels of math, there is considerably more parallelism of objectives, while in the	

Consultant(s)	Critique	Recommendations
Dr. Bruce Tuckman (Cont.)	more advanced material such as the calculus, sequences become distinctive and complex.	
Algebra I	Algebra I objectives are excellent.	
Dr. David W. Wells Director of Mathematics Education, Oakland Schools	In each instance, the sequencing of the objectives seemed appropriate.	
Mathematics Overview	In many cases it was difficult for me to make a judgment as to whether the percent accuracy required was appropriate because of the great latitude offered in the choice of the levels of difficulty for the criterion test.	Overuse of language might be avoided and the intent of the objectives clarified by use of illustrative examples that become a part of the set of objectives.
	There seemed to be some overuse of language that obscured the intent of the objective.	There are topics to be given consideration not included in the list of objectives: 1. Absolute value 2. Trigonometric ratios 3. Logic 4. Exponents 5. Scientific notation 6. Similarity
	Most of the objectives do not adequately define the level of problems the learner is required to solve.	
Junior High School	Junior High School Mathematics:	
	The precise meaning of "problem involving," "solution set," and "demonstrate a solution set" are not clear.	Use either English sentences or word sentences throughout so as not to imply vaguely a difference between the two.

Consultant(s)	Critique	Recommendations
Dr. David W. Wells (Cont.)	It is confusing to use "constructing," implying that only a straight edge and compass is permitted, and "drawing," implying that any instrument can be used, in the same objective.	It would be helpful to have two or three examples of types of problems described. IPO's associated with TPO's, such as TPO 5.0, need greater specificity with respect to the difficulty of the "problems." The intent of the objective should be clear without going to another source.
Dr. James Beaird Oregon State System of Higher Education Science Overview	The strategy employed in the generation of these sets of objectives is overwhelmingly positive. From the general cognitive hierarchy a general form for the objectives at each level of this hierarchy was developed. These general forms, discipline objectives, really provide a beautiful base for getting groups of teachers involved in applying the concepts and instructional specifications to their particular content interest. The overall quality of the objectives at all levels is excellent.	Some attention should be paid to the naming and identifying of objectives at the IPO and CO level. Some clarification is required for those IPO's and CO's calling for description of similarities, differences, and relationships.

Consultant(s)	Critique	Recommendations
Dr. James Beaird (Cont.) Junior High School	In the area of elementary and junior-high-school science not one type at the model building level and relatively few representing the experimental cognitive level were encountered.	
Physics	There are references to "student—collected data" with absence of TPO's at the experimentation level.	I suggest you rewrite TPO 1.0 for the experiment level. This is one place to reflect the goals of science instruction: data collection, analysis, and model building. A sequence on atomic and molecular structure may be appropriate prior to TPO 4.0 (Physics). Because of interdependence of physics and your description objectives could be made more specific by relying upon this relationship and by requiring description by formulas, graphs, tables, etc.
Chemistry		I suggest the Chemistry course be refined so that (1) You have more TPO's and (2) Some essential sequence is built in, and (3) The course should move kids to the experimenting level and TPO's should be looked at in this light.

TABLE 16

OBJECTIVE CRITIQUES OF COURSE/SUBJECT AREAS BY CONSULTANTS

PHASE II (SUBJECT-MATTER SPECIALISTS)

Course/Subject Area	Are Course objectives adequate to justify course credit?			Are the objectives and accompanying materials transmissible to professionally trained personnel in the subject-area field?			Are the objectives of a sound educational quality to be accepted by the professional subject-area groups?		
	Yes	No	Undetermined	Yes	No	Undetermined	Yes	No	Undetermined
Art II	x			x		x	x		
Jewelry	x			x			x		
Photography	x			x			x		
Family Living	x			x			x		
Ind. Educ(Arch)			x		x		x	x	
E. G.	x				x		x		x
Special Power			x		x			x	
Arc Welding			x		x			x	
Oxy - Oct-Weld	x				x			x	
Res. Welding	x				x			x	
Junior High		x			x			x	
Wood		x			x			x	
J. H. Fastening	x				x		x		

Course/Subject Area	Are Course objectives adequate to justify course credit?			Are the objectives and accompanying materials transmissible to professionally trained personnel in the subject-area field?			Are the objectives of a sound educational quality to be accepted by the professional subject-area groups?		
	Yes	No	Undetermined	Yes	No	Undetermined	Yes	No	Undetermined
Metal Band Saw	x				x				x
General Music	x			x			x		x
Choral Music	x			x			x		
Band	x			x				x	x
Wind Instruments	x			x			x		
String Techniques	x			x			x		
7th & 8th Gr. Art	x			x			x		
Art I	x			x			x		
Communication Skills									
Reading	x			x			x		
Writing	x			x				x	
Listening	x			x					x
Research Location	x					x	x		
Oral	x			x			x		
Foreign Languages			x			x			x
Basic Spanish I	x			x			x		

Course/Subject Area	Are Course objectives adequate to justify course credit?			Are the objectives and accompanying materials transmissible to professionally trained personnel in the subject-area field?			Are the objectives of a sound educational quality to be accepted by the professional subject-area groups?		
	Yes	No	Undetermined	Yes	No	Undetermined	Yes	No	Undetermined
Spanish II			x			x			x
Spanish I	x					x			x
Clothing Construction		x			x			x	
Algebra I	x			x			x		
Algebra II	x			x			x		
Trigonometry	x			x			x		
Elementary Analysis	x			x			x		
Calculus	x			x			x		

TABLE 17

OBJECTIVE CRITIQUES OF COURSE/SUBJECT AREAS BY CONSULTANTS

PHASE II (BEHAVIORISTS)

	Are the objectives and accompanying materials transmissible to professionally trained personnel in the subject-area field?			Are the objectives of a sound educational quality to be accepted by the professional subject-area groups?			Is there an appropriate balance between the course- or subject-area objectives and the stated discipline objectives in terms of content and cognitive process?		
Course/Subject Area	Yes	No	Undetermined	Yes	No	Undetermined	Yes	No	Undetermined
Communication Skills									
Reading	x			x					x
Writing	x			x					
Humanities (7th)	x					x		x	
Humanities (8th & 9th)	x			x			x		
Mathematics	x			x					
Mathematics (Elem.)	x			x			x		
Mathematics (Jr.High)	x			x			x		
Algebra I	x			x			x		
Science (Scheme G)	x			x					x
Science (7th Gr.)	x			x			x		
Science (8th Gr.)	x			x			x		
Biology I	x					x			x
Algebra II	x			x			x		
Geometry	x			x			x		
Calculus	x			x			x		
Biological Science (Discipline Objectives)	x			x			N/A		

Course/Subject Area	Are the objectives and accompanying materials transmissible to professionally trained personnel in the subject-area field?			Are the objectives of a sound educational quality to be accepted by the professional subject-area groups?			Is there an appropriate balance between the course- or subject-area objectives and the stated discipline objectives in terms of content and cognitive process?		
	Yes	No	Undetermined	Yes	No	Undetermined	Yes	No	Undetermined
Biology II	x			x			x		
Science (High School)	x				x				x
Physics	x			x			x		

TABLE 18

CONSULTANT RECOMMENDATIONS BY COURSE/SUBJECT AREA AND OBJECTIVE

PHASE II (SUBJECT-MATTER SPECIALISTS)

Course/ Subject Area	Objective Number	Recommended Revisions					Recommended Additions						
		à la Mager - 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher Developed Materials	Learning Strategies	Pretests	Post-tests	Identification of Prerequisites
Art II	TPO 1.0		x										
	IPO 1.1	x											
	IPO 1.2	x											
	IPO 1.3 C	x											
	IPO 2.1		x										
	2.2		x										
	2.3		x										
	2.4		x										
	2.5	x	x										
	2.6		x										
	2.7		x										
	IPO 3.1		x										
	3.2		x										
	3.3		x										
	3.4		x										

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	3.5		x										
	3.6		x										
	3.7		x										
	IPO 4.2	x											
	4.3	x											
	IPO 6.2	x											
	6.4	x											
	IPO 7.1		x										
	7.3		x										
	7.5		x										
	7.6		x										
	7.7		x										
	TPO 8.0	x											
	IPO 8.4		x										
	IPO 8.6		x										
Jewelry	IPO 3.4		x										
Photography	TPO 1.0												x
	IPO 1.3		x										

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	1.6		x										
	1.9		x										
	1.12		x										
	TPO 6.0						x						
	IPO 6.1						x						
	6.2						x						
	6.3						x						
Family Living	TPO 1.0			x				x					
	2.0							x					
	3.0	x	x					x					
	CO 10					x							
	TPO 5.0							x					
Ind Educ (Archy)	CO 9					x							
	IPO 22	x									x	x	
	23b										x	x	
	IPO 5.2A	x									x	x	
	5.4A	x									x	x	

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	5.6A	x									x		
	5.7A	x									x		
	5.10A	x									x		
E.G.	IPO 2.1d		x										
	2.4c		x										
Special Power	IPO 1.2	x											
	2.6a	x											
	2.6b	x											
	2.6c	x											
	2.6d	x											
Arc Welding	IPO 1.1		x										
	1.2		x										
	1.3		x										
	4.2A		x										
	4.2B		x										
	4.2C		x										

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
General Music	MS 1.2			×									
	1.3			×									
	1.4	×	×	×			×						
	1.5						×						
	1.6		×										
	1.7			×									
	1.8			×									×
	1.9			×									
	1.10			×									
	1.11		×	×									
	1.1			×									
	2			×									
	3			×									
	4			×									
	5			×									
	6			×									
	7		×	×									
	8			×									

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	9			x									
	10		x	x			x			x			
	11			x									
	12			x			x			x			
	13			x			x			x			
	14		x	x					x				
	15		x	x									
	16			x									
	17		x	x									
	18			x									
	MS 1.13		x	x									
	1.14		x										x
	1.16		x		x								
	1.17			x									
	1.18			x									
	1.19		x		x								
	2.1			x									
	2.2			x									
	2.3			x									
	2.4			x									

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	2.5			x									
	2.6			x									
	2.7			x									
	2.8			x									
	2.9			x									
	3.1			x			x						
	3.2						x						
	3.3			x									
	3.4			x									
	3.5			x									
	3.6			x									
	3.7			x			x						
	3.8			x			x						
	3.9			x									
	3.10			x									
	3.11			x									
	3.12			x									
	4.3			x	x	x							
	4.4		x		x								

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
Choral Music	4.5	x			x								
	5.3					x							
	5.4		x										
	1		x										
	2		x	x									
	3			x									
	4			x									
	5			x									
	6			x									
	7			x									
	8			x									
	9			x									
	10			x									
	11			x									
	12			x									
	13			x									
	14			x									
	15			x									

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	16			x									
	17			x									
	18			x									
	19			x									
	20			x									
	21			x									
	22			x									
	23			x									
	24			x									
	25			x									
	26			x									
	27			x									
Band Tech-niques	MSB 1.1		x	x									
	1.2		x	x									
	1.3		x	x									
	1.4		x	x									
	1.5		x	x									
	1.6		x	x									

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	1.7		×	×									
	1.8		×	×									
	1.9		×	×									
	2.1			×									
	2.2			×									
	2.3			×									
	2.4			×									
	2.5			×									
	2.6			×									
	2.7			×									
	2.8			×									
	2.9			×									
	3.2		×										
	3.5		×										
	3.9		×										
	3.10		×										
	4.1			×									
	4.2			×									
	4.3							×					

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	4.4			x									
	4.5			x									
	4.6			x									
	4.7			x									
Wind Instruments	2.			x									
	2.1			x									
	2.2			x									
	2.3			x									
	3.		x										
	3.1			x									
	3.2			x									
	3.3a		x	x									
	3.4		x	x									
	3.5		x	x									
	3.6		x	x									
	3.7		x	x									
	3.8			x									
	3.9			x									

Course/ Subject Area	Objective Number	Recommended Revisions					Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	3.10			x									
	3.11		x	x									
	3.12		x	x									
	3.13			x			x						
	3.14			x			x						
	3.15			x									
	3.16			x									
	4.5			x									
	4.6			x									
	4.7			x									
	4.8			x									
	5.0							x					
	5.1							x					
	5.2							x					
	5.3							x					
String Techniques	1.1		x										
	2.0			x									
	2.1			x									

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	2.2			x									
	2.3			x									
	2.4					x							
	3.3					x							
	3.5	x											
	4.0			x									
	5.			x									
	5.1			x									
	5.2			x									
	5.3			x									
	5.4			x									
	5.5			x									
	5.6			x									
	5.7			x									
	6.0			x									
	6.1			x									
	6.2			x									
	6.3			x									
	6.4			x									

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	6.5			x									
	6.6			x									
	6.7			x									
	7.0			x									
	7.1			x									
	7.2			x									
	7.3			x									
	7.4			x									
	7.5			x									
	7.6			x									
	7.7			x									
	8.0	x											
	8.1	x											
	8.2	x											
	8.3	x											
	8.4		x										
	8.7	x	x										
	9.1			x									
	9.2							x					

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	9.3							x					
	9.4							x					
	9.5							x					
Wrestling							x						
Softball							x						
Tennis							x		x	x			
Track			x										
Side Horse							x						
Rope Climbing						x							
Archery	PS 19.4		x										
	CS 8										x	x	
	9										x	x	
	10										x	x	
	11										x	x	
	12						x						
	13						x						
	14						x						

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
Badminton	CS 10						x						
Basketball	1. K						x						
	1. L						x						
Art 7 & 8	IPO 1.6	x											
	1.9	x											
	TPO 2.0	x											x
	IPO 2.5	x											x
	2.8	x	x										
	2.12		x										
	TPO 3.0		x										
	IPO 3.6		x										
	TPO 4.0		x										
	IPO 4.2	x											
	4.4	x											
	4.9		x										
	TPO 5.0		x										
	IPO 5.7	x											
	5.10	x											
	5.11						x						

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	5.12						×						
	5.13	×					×						
	5.14	×					×						
	5.15						×						
	5.16	×					×						
	5.17	×											
	5.18						×						
	5.19	×					×						
	5.20	×					×						
	5.22	×					×						
	5.23	×					×						
	5.24		×				×						
Art I	TPO 1.0									×			
	IPO 1.1									×			
	1.2									×			
	1.3									×			
	1.4		×							×			
	TPO 3.0		×										
	IPO 3.1	×	×										

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	3.3	×	×										
	3.4	×					×						
	4.3	×											
	4.4		×										
	4.5	×											
	5.3		×										
	6.3	×	×										
	6.4		×				×						
	6.5						×						
Communication Skills Reading	R 1.1d					×							
	1.1b					×							
	1.4c		×			×							
	1.13					×							
Research Location	RL 1.0					×							
	1.1					×							
	1.2					×							

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	4.3		x										
	5.3		x										
	7.1					x							
	9.2		x										
Foreign Languages	DO 2.0A &B								x		x	x	
	TPO 1.0								x		x	x	
	IPO 1.1								x		x	x	
	1.2								x		x	x	
	1.3								x		x	x	
	1.4								x		x	x	
	1.5								x		x	x	
	1.6								x		x	x	
	1.7								x		x	x	
	TPO 2.0								x	x	x	x	
	IPO 2.1								x	x	x	x	
	2.2								x	x	x	x	
	2.3								x	x	x	x	

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	2.4								×	×	×	×	
	2.5								×	×	×	×	
	2.6								×	×	×	×	
	2.7								×	×	×	×	
	TPO 3.0		×						×	×	×	×	
	IPO 3.1		×						×	×	×	×	
	3.2		×						×	×	×	×	
	3.3		×						×	×	×	×	
	3.4		×						×	×	×	×	
	3.5		×						×	×	×	×	
	3.6		×						×	×	×	×	
	3.7		×						×	×	×	×	
	TPO 4.0		×						×	×	×	×	
	IPO 4.1		×						×	×	×	×	
	4.2		×						×	×	×	×	
	4.3		×						×	×	×	×	
	TPO 4.0		×						×	×	×	×	
	IPO 4.1		×						×	×	×	×	
	4.2		×						×	×	×	×	

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	4.3		x						x	x	x	x	
	4.4		x						x	x	x	x	
	4.5		x						x	x	x	x	
	4.6		x						x	x	x	x	
	4.7		x						x	x	x	x	
	TPO 5.0		x						x	x	x	x	
	IPO 5.1		x						x	x	x	x	
	5.2		x						x	x	x	x	
	5.3		x						x	x	x	x	
	5.4		x						x	x	x	x	
	5.5		x						x	x	x	x	
Basic Spanish I	CO 1										x		
	2										x		
	3										x		
	4										x		
	5										x		
	6										x		

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
Spanish II	1								x		x		x
	2								x		x		x
	3								x		x		x
	4								x		x		x
	5								x		x		x
	6								x		x		x
	7								x		x		x
	8								x		x		x
	9								x		x		x
	10								x		x		x
	TPO 1.0								x		x	x	x
	IPO 1.1								x		x	x	x
	1.2								x		x	x	x
	1.3								x		x	x	x
	1.4								x		x	x	x
	1.5								x		x	x	x
	1.6								x		x	x	x
	1.7								x		x	x	x

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	TPO 2.0								x		x	x	x
	IPO 2.1								x		x	x	x
	2.2								x		x	x	x
	2.3								x		x	x	x
	2.4								x		x	x	x
	2.5								x		x	x	x
	2.6								x		x	x	x
	2.7								x		x	x	x
	TPO 3.0								x		x	x	x
	IPO 3.1								x		x	x	x
	3.2								x		x	x	x
	3.3								x		x	x	x
	3.4								x		x	x	x
	3.5								x		x	x	x
	3.6								x		x	x	x
	3.7								x		x	x	x
Clothing Construction	CO 1		x										
	2		x	x				x	x				

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	IPO 1.3c					×							
	CO 4					×		×	×	×			
	5		×		×	×							
	IPO 1.6a			×									
	CO 7								×				
	IPO 1.7c			×									
	IPO 4			×									
	CO 9			×									
	10	×	×										
	11	×											
Algebra I	TPO 1.0		×										
	CO 5		×										
	CO 6		×										
	IPO 6.5		×										
Algebra II	IPO 2.5		×										
	5.7		×										
	5.8		×										
	5.9		×										
	5.10		×										

Course/ Subject Area	Objective Number	Recommended Revisions						Recommended Additions					
		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Unrealistic Time Factor	Elimination Of Objective Desirable	Change of Sequence Desirable	Commercial Materials	Teacher - Developed Materials	Learning Strategies	Pretests	Post-tests	Identification Of Prerequisites
	5.11		x										
	6.3		x										
	6.4		x										
	6.5		x										
	6.8		x										
	6.11		x										
	7.11		x										
	7.12		x										
	7.13		x										
	8.3		x										
	8.4		x										
	8.5		x										
Trigo - nometry	TPO 2.0	x	x										
	IPO 2.5	x	x										
	TPO 3.0	x	x										
Calculus	TPO 2.1a		x										
	2.1b	x	x										
	2.1d	x	x										
	2.1e	x											

TABLE 19

CONSULTANT RECOMMENDATIONS FOR REVISIONS BY COURSE/SUBJECT AREA AND OBJECTIVE

PHASE II (BEHAVIORISTS)

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Communication Skills	R1.0	x							
	R1.1	x							x
	R1.2	x							
	R1.3	x							
	R1.4								x
	R1.5								x
	R1.13	x							
	R2.0								x
	R2.1	x							
	R2.2	x							
	R2.3								x
	R2.4								x
	R2.5	x							
	R2.6	x							
	R2.7	x							
	R2.8	x	x						
	R2.9	x	x						

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Communi- cation Skills	R2. 10								x
	R3.0	x							
	R3.1								x
	R3.5	x							
	R3.7								x
	R3.8	x							x
	R3.9	x							
	R4.0	x							
	R4.1	x							
	R5.0								
	R5.1	x							x
	R5.2								
	R5.3								x
	R6.0	x							x
	R6.1								
	R6.2								x
	R6.3	x							x
	R6.4	x							
	R7.0								x
	R7.1								x
	R7.2								x
	R7.3								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Communi-cation Skills	R8.0	x							
	R8.1	x							
	R8.2	x							
	R9.0	x							
	R11.0	x							
	R12.0	x							
	R12.1	x							
	R13.0								x
	R17.0								x
	R17.1								x
	R17.2								x
	R18.0	x							
	R18.1	x							
	R18.2	x							
	R18.3	x							
	R18.4	x							x
	R18.5								x
	R18.6								x
	R18.7								x
	R19.0								
	R19.1	x							
	R20.0	x							
	R20.1	x							

Course/ Subject Area	Objective Number	a la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Communication Skills	R20.2	x							
	R20.3	x							
	R20.4	x							
	R20.5	x							
	R23.0	x							
	W1.0	x	x	x	x				
	W1.1								x
	W1.1a		x						
	W1.1c	x							
	W1.2								x
	W1.3								x
	W1.4								x
	W1.5								
	W1.6								x
	W1.7								x
	W1.8								x
	W1.9								x
	W1.10								x
	W1.11								x
	W1.12								x
	W1.13								x
	W1.14								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Communication Skills	W1.16								x
	W1.16b	x							x
	W1.17								x
	W1.18								x
	W1.19								x
	W1.20								x
	W1.22	x							
	W1.23								x
	W1.29								x
	W1.30	x	x						
	W1.30a								x
	W1.30b								x
	W1.30c	x	x						
	W1.30d								x
	W1.30e								x
	W1.30f								x
	W1.30g		x						
	W1.30h		x						
	W1.30i		x	x					
	W1.30j	x							
	W1.30K	x							
	W1.30l	x							
	W1.30m	x							

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Communi-cation Skills	W1.30n	x							
	W1.31		x						
	W1.31a								x
	W1.31b								x
	W1.32	x							
	W1.32c								x
	W1.33								x
	W2.1	x							
	W2.2								x
	W2.3	x							
	W2.3a								x
	W2.3b								x
	W2.4	x							
	W2.4a								x
	W2.4b								x
	W3.0	x							
	LS1.0	x							
	LS2.0	x							
	LS3.0								x
	LS4.0								x
	LS5.0								x
	LS6.0								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Communication Skills	LS6.1	x				x			
	LS7.0	x							
	RL1.0								x
	RL2.0	x							
	RL3.0	x	x						
	RL3.1								x
	RL3.2								x
	RL4.0		x						
	RL4.1		x						
	RL4.2		x						
	RL4.3	x							
	RL5.0	x	x						
	RL5.1		x						
	RL5.2		x						
	RL5.3		x						
	RL5.4		x						
	RL5.5	x							
	RL6.0								x
	RL7.0			x					
	RL7.1		x		x				
	RL7.2	x							
	RL7.3	x							
	RL7.4	x							

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Communication Skills	RL7.5	x							
	RL7.6	x	x						
	RL8.0	x	x						
	RL8.1	x	x						
	RL8.2								x
	RL8.3								x
	RL8.4								x
	RL8.5								x
	RL8.6								x
	RL9.0								x
	RL9.1								x
	RL9.2	x							
	RL9.3	x							
	RL9.4								x
	RL9.5	x							
	RL9.6	x		x					
	RL10.0		x						
	O1.0								x
	O2.0	x		x					
	O2.1	x	x						
	O2.2								x
	O3.0	x		x					

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Communication Skills	O4.0		x	x			x		
	O4.5								x
	O4.6	x	x			x			
	O4.7								x
	O5.0								x
	O5.5				x				
	O5.6					x			
	O5.7		x						
	O5.7a	x	x	x					
	O5.7b	x	x	x					
	O5.7c	x	x	x					
	O6.0	x							
	O6.1								x
	O6.2		x						
	O6.3		x						
	O6.4	x	x	x					
	O6.5	x	x						
	O7.0	x		x					
	O7.1								x
	O7.2								x
	O7.3								x
	O7.5	x	x						

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Communication Skills	O7.6	x	x						
	O8.0	x	x						
Humanities (7th Gr)	TPO1.0								x
	IPO1.1		x					x	
	1.2		x						
	1.3								x
	1.4								x
	1.5		x					x	
	TPO2.0		x						
	IPO2.1		x						
	2.2		x						
	2.3								x
	2.4								x
	2.5		x					x	
	TPO3.0		x						
	IPO3.1		x					x	
	3.2		x						
	3.3								x
	3.4								x
	3.5		x						

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Humanities (7th)	TPO4.0		x					x	
	IPO4.1		x						
	4.2		x						
	4.3								
	4.4								x
	4.5		x						x
	TPO5.0		x					x	
	IPO5.1		x						
	5.2		x						
	5.3								
	5.4								x
	5.5		x						x
	TPO10.0							x	
	IPO 10.1						x		
	10.2		x	x					
	10.3		x	x					
	10.4		x	x					
	10.5		x	x				x	
	10.6				x		x	x	
	10.7				x		x	x	
	10.8		x	x				x	
	10.9				x				

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Humanities (8th & 9th gr.)	IPO10.10								x
	CO1		x						
	2								x
	3								x
	4								x
	5	x							
	6								
	7								x
	8								x
	9								x
	10								x
	11								x
	12								x
	13								x
	14								x
	15								x
	16	x							x
	17								x
	18		x						
	19								x
	20								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Humanities (8th & 9th Gr.)	TPO1.0		x						x
	IPO1.1		x						x
	1.16								x
	1.2	x							
	1.3								x
	1.4								x
	1.5								x
	TPO 2.0								x
	IPO 2.1								x
	2.1a		x						x
	2.2								x
	2.3								x
	2.4								x
	2.5								x
	2.6								x
	TPO 3.0								x
	IPO 3.1								x
	3.2								x
	3.3								x
	3.4								x
	3.5								x
	3.6	x							

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Humanities (8th & 9th gr)	IPO3.7								x
Mathematics	DO1.0A								x
	DO2.0A								x
	DO3.0A								x
	DO4.0A								x
	DO5.0A								x
	DO1.0B		x						
	DO2.0B		x						
	DO3.0B		x						
	DO4.0B		x						
	DO5.0B		x						
	DO1.0C		x						
	DO2.0C		x						
	DO3.0C		x						
	DO4.0C		x						
	DO5.0C		x						
Math (Elem.)	M 1.0								x
	PM 1.1								x
	1.2								x
	1.3								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Math (Elem)	1.4		x				x		
	1.5		x				x		
	1.6		x				x		
	1.7		x				x		
	1.8		x				x		
	1.9		x				x		
	1.10		x				x		
	2.0		x	x			x		
	2.1		x	x			x		
	2.2		x	x			x		
	2.3		x	x			x		
	2.4		x	x			x		
	2.5		x	x			x		
	2.6		x	x			x		
	2.7		x	x			x		
	2.8		x	x			x		
	2.9		x	x			x		
	3.0			x					
	3.1			x					
	3.2			x					
	3.3			x					

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Math (Elem.)	PM 3.4			x					
	IM 4.0		x						
	PM 4.1			x					
	4.2			x					
	4.3		x	x					
	4.4		x	x					
	4.5		x	x					
	IM 4.6		x	x					
	4.7		x	x					
	4.8		x	x					
	5.0		x	x					
	5.1		x	x					
	5.2		x	x					
	5.3		x	x					
	5.4		x	x					
	5.5		x	x					
	5.6		x	x					
	5.7		x	x					
	5.8		x	x					
	5.9		x	x					
	6.0		x						
	6.1		x						

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
	IM 6.2		x						
	6.3		x						
	7.0		x						
	PM 7.1		x	x					
	IM 7.8		x	x					
	8.0		x	x					
	8.1		x	x					
	8.2		x	x					
	8.3		x	x					
	8.4		x	x					
	8.5		x	x					
	8.6		x	x					
	9.0		x						
	9.1		x						
	9.2		x						
	9.3		x						
	10.0		x						
	PM 10.1		x						
	IM 10.2		x	x					
	10.3		x	x					
	10.4								x
	11.0		x						

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
	IM 11.1		x						
	11.2		x						
	11.3		x						
	11.4		x						
	11.5		x						
	12.0		x						
	12.1		x						
	12.2		x						
	12.3		x						
	12.4		x						
	12.5		x						
	PM 13.0								x
	– 13.10								x
	14.0–14.4								x
	15.0–15.14								x
	16.0–16.2								x
	17.0								x
	IM 18.0								x
	19.0–19.5								x
	20.0–20.33								x
	21.0–21.4								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Math (Elem)	22.0								x
	PM 22.8								x
	IM 23.0								x
	23.5								
	24.0		x						
	PM 24.5		x						
	25.0 –25.4			x					
	26.0 – 26.17								x
	27.0–27.4								x
	28.0 –28.11								x
	29.0 – 29.7								x
	28.0 –28.11								x
	29.0–29.7								x
	30.0–30.10								x
	31.0– 31.9			x					
	32.0								
	33.0								x
	34.0								x
	35.0–35.16								x
	36.0–36.5								x
	40.0 –40.2							x	
	40.3–40.4								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Math (Elem)	40.5–40.11						x		
Mathematics (Jun.High)	1.0								x
	1.1			x					
	1.2–1.4								x
	2.0–2.3								x
	3.0								x
	3.1		x						
	3.2–3.4								x
	5.0–5.6								x
	6.0–6.4								x
	7.0– 7.5								x
	8.0 – 8.8			x					
	9.0 – 9.2			x					
	10.0 –10.8								x
	11.0–11.4								x
	12.0 –12.5								x
	13.0 – 13.4		x				x		x
	14.0 –14.2								x
Algebra I	1.0 – 1.6								x
	2.0 – 2.5								x
	3.0 – 3.5								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Algebra I	4.0 – 4.6								x
	5.0 – 5.5								x
	6.0 – 6.5								x
	7.0 – 7.5								x
	8.0 – 8.5								x
	9.0 – 9.6								x
	10.0–10.6								x
	11.0 –11.5								x
	12.0 –12.5								x
	13.0 –13.5								x
	14.0 – 14.5								x
	15.0 – 15.5								x
	16.0 – 16.5								x
	17.0 – 17.5								x
	18.0 – 18.5								x
	19.0 – 19.5								x
	20.0 – 20.5		x						
Science Scheme A (Energy)	A 1.0								x
	A 1.1								x
	A 1.2						x		
	A 2.0						x		
	A 2.1								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Science Scheme A (Energy)	A2.2								x
	A3.0								x
	A3.1								x
	A3.2								x
	A4.0								x
	A4.1		x						
	A4.2		x						
	A5.0								x
	A5.1								x
	A6.0								x
	A6.1								x
	A6.2								x
	A6.3								x
Science Scheme B	B1.0								x
	B1.1								x
	B1.2								x
	B2.0								x
	B2.1								x
	B3.0								x
	B3.1								x
	B3.2			x					
	B4.0								
	B4.1								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Science Scheme B	B4.2								×
	B5.0								×
	B5.1		×						
	B6.0								
	B6.1								×
	B6.2								×
	B6.3								×
	B6.4								×
Science Scheme D		×							
Science Scheme F	F1.0								
	F1.1								×
	F1.2								×
	F2.0								×
	F2.1								×
	F3.0		×						
	F3.1								×
	F3.2			×					
	F4.0								×
	F4.1								×
	F5.0								×
	F5.1								×
	F5.2								×

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Science Scheme F	F6.0								x
	F6.1								x
Science Scheme G	G2.0								x
	G2.1								x
	G2.2								x
	G2.3								x
	G2.4								x
	G3.0								x
	G3.1		x						
	G3.2								x
	G4.0								x
	G4.1								x
	G4.2								x
	G5.0								x
	G5.1								x
	G5.2								x
	G5.3								x
	G6.0								x
	G6.1		x						
	G6.2								x
Science (7thG.)	TPO1.0								x
	IPO1.1								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Science (7th Gr.)	1.2								×
	1.3								×
	1.4		×						
	1.5		×						
	CO1								×
	2								×
	3								×
	4					×			
	5								×
	6								×
	TPO2.0								×
	IPO2.1								×
	2.2								×
	2.4								×
	2.5								×
	CO8								×
	TPO3.0								×
	IPO3.1								×
	3.2								×
	3.3								×
	3.4								×
	3.5								×

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Science (7thG)	CO 10								x
	11								x
	12								x
Science (8thG.)	TPO 1.0								x
	IPO 1.1								x
	1.2								x
	1.3								x
	1.4								x
	CO 1								x
	2								x
	3								x
	4								x
	TPO 2.0								x
	IPO 2.1								x
	2.2								x
	2.3								x
	2.4								x
	2.5								x
	2.6								x
	CO 5								x
	6								x
	7								x
	8								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Science (8th G.)	TPO 3.0								x
	IPO 3.1								x
	3.2								x
	3.3								x
	3.4								x
	3.5								x
	3.6								x
	CO 9								x
	10								x
	11								x
	12								x
	13								x
	14								x
	TPO 4.0								x
	IPO 4.1								x
	4.2								x
	4.3								x
	4.4								x
	4.5								x
	4.6								x
	CO 15						x		
	16						x		

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Science (8th G.)	CO 17						x		
	TPO 5.0								x
	IPO 5.1								x
	5.2								x
	5.3								x
	5.4								x
	5.5								x
	5.6								x
	CO 18								x
	19								x
	20								x
	21								x
	TPO 6.0								x
	IPO 6.1								x
	6.2								x
	6.3								x
	6.4								x
	6.5								x
	6.6								x
	CO 22								x
	CO 23		x						

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Science (8th G.)	CO 24		×						
	CO 25								×
	TPO 7.0		×						
	IPO 7.1			×					×
	7.2								×
	7.3								×
	7.4								×
	7.5								×
	7.6								×
	CO 26a,b,e								×
	26f,g,h, i,j		×						
	26c		×						
Biology I	TPO 1.0								×
	IPO 1.1								×
	1.2								×
	1.3								×
	1.4								×
	CO 1								×
	2								×
	3								×
	TPO 2.0								×
	IPO 2.1								×

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Biology I	2.2								x
	2.3								x
	2.4								x
	TPO 3.0								x
	IPO 3.1								x
	3.2								x
	3.3								x
	3.4								x
	CO 4								x
	5								x
	6								x
	TPO 4.0								x
	IPO 4.1								x
	4.2								x
	4.3								x
	4.4								x
	CO 7								x
	8								x
	TPO 5.0								x
	IPO 5.1								x
	5.2								x
	5.3								x
	5.4								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Biology I	CO 9								x
	10								x
	11								x
	12								x
	13								x
	TPO 6.0								x
	IPO 6.1								x
	6.2								x
	6.3								x
	6.4								x
	CO 14								x
	15								x
	16								x
	17								x
	TPO 7.0		x						
	IPO 7.1								x
	7.2								x
	7.3								x
	7.4								x
	CO 18								x
	19								x
	20								x
	21								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Biology I	22								×
	23		×						
	24								×
	25								×
	26								×
	27								×
	TPO 8.0		×						
	IPO 8.1		×						
	8.2								×
	8.3								×
	8.4								×
	CO 28								×
	29								×
	TPO 9.0		×						
	IPO 9.1								×
	9.2								×
	9.3								×
	9.4	×							
	9.5	×							
	9.6	×							
Algebra II	1.0								×
	1.1-1.6		×						

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Algebra II	2.0								x
	2.1–2.7								x
	3.0								x
	3.1–3.8								x
	3.9–3.12								x
	4.0								x
	4.1–4.6								x
	5.0								x
	5.1–5.8								x
	5.9–5.11								x
	6.0								x
	6.1–6.11								x
	7.0								x
	7.1–7.9								x
	7.10–7.13								x
	8.0								x
	8.1–8.5								x
	9.0								x
	9.1–9.5								x
Geometry	CO 1–11								x
	1.0								x
	1.1–1.8				x				x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Geometry	1.9–1.15								×
	2.0		×						
	2.1–2.5								×
	2.6–2.11		×			×			
	3.0								×
	3.1–3.9								×
	4.0								×
	4.1–4.4					×			
	5.0								×
	5.1–5.6					×	×		
	6.0								×
	6.1–6.8								×
	7.0								×
	7.1–7.5								×
	8.0		×						
	8.1–8.4					×			
	9.0								×
	9.1–9.3								×
	10.0								×
	10.1–10.6								×
	11.0								×
	11.1–11.10								×

Course/ Subject Area	Objective Number	\ a la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Geometry	12.0								x
	12.1–12.8								x
	12.9–12.11								x
Calculus	CO 1–4								x
	5–9								x
	10–12								x
	1.0								x
	1.1–1.8						x		
	1.9–1.11			x					
	1.12–1.14						x		
	2.0								x
	2.1								x
	2.2–2.4		x						
	2.5–2.7								x
	2.8		x						
	2.9–2.10						x		
	2.11–2.12						x		
	3.0								x
	3.1–3.3			x					
	3.4–3.6								x
	3.7								x
	4.0								x

Course/ Subject Area	Objective Number	\ a la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Calculus	4.1–4.3		x						
	5.0								x
	5.1–5.2		x						
	6.0								x
	6.1–6.2								x
	6.3–6.4		x						
	6.8–6.9								x
Biological Science	DO 1.0A								x
	DO 2.0A								x
	DO 3.0A								x
	DO 4.0A		x		x				
	DO 5.0A		x		x				
	DO 1.0B								x
	DO 2.0B								x
	DO 3.0B								x
	DO 4.0B		x		x				
	DO 5.0B		x		x				
Physical Science	DO 1.0A		x						
	DO 2.0A		x						
	DO 3.0A								x
	DO 4.0A		x		x				
	DO 5.0A		x		x				

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Physical Science	DO 1.0B		x						
	DO 2.0B		x						
	DO 3.0B								x
	DO 4.0B		x		x				
	DO 5.0B		x		x				
	DO 1.0C								x
	DO 2.0C								x
	DO 3.0C								x
	DO 4.0C		x		x				
	DO 5.0C		x		x				
Biology II	TPO 1.0								x
	IPO 1.1								x
	1.2								x
	CO 1								x
	2								x
	4								x
	7								x
	3								x
	5		x						
	6		x						
	TPO 3.0		x						

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Biology II	IPO 3.1								x
	3.2								x
	3.3								x
	CO 8								x
	9								x
	TPO 4.0		x						
	IPO 4.1		x						
	4.2				x				
	4.3								x
	4.4		x						
	4.5								x
	4.6								x
	4.7								x
	4.8								x
	4.9		x						x
	TPO 5.0								x
	IPO 5.1								x
	5.2								x
	5.3								
	TPO 6.0								x
	IPO 6.1							x	
	6.2								x
	6.3								x

Course/ Subject Area	Objective Number		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Biology II	TPO	7.0		×						
	IPO	7.1								×
		7.2								×
		7.3		×						
		7.4		×						×
		7.5								×
		7.6								×
		7.8								×
		7.9								×
		7.10								×
	CO	13				×				
		14				×				
	TPO	8.0								×
	IPO	8.1		×						
		8.2								×
		8.3								×
		8.4								×
	TPO	9.0		×						×
	IPO	9.1								×
		9.2								×
		9.3								×
		9.4								×

Course/ Subject Area	Objective Number		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Biology II		9.5								x
		9.6								x
		9.7								x
		9.8								x
		9.9								
	TPO	10.0								x
	IPO	10.1								x
		10.2								x
		10.3								x
	CO	16								x
	CO	17		x						
	TPO	11.0a		x						
	IPO	11.1a				x				
		11.2a								x
		11.3a		x						
		11.4a								x
		11.5a								x
		11.6a								x
		11.7a								x
		11.8a								x
		11.9a								
	TPO	11.0b		x						

Course/ Subject Area	Objective Number		à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Biology II	IPO	11.1b								x
		11.2b								x
		11.3b								x
		11.4b								x
		11.5b								x
		11.6b								x
		11.7b			x					
		11.8b								x
Science (High School)	TPO	1.0								x
	IPO	1.1				x				
		1.2								x
		1.3								x
		1.4								x
	CO	1								x
		2								x
		3								x
		4		x						
		5								
		6								x
	TPO	2.0		x						x
	IPO	2.1								

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Science (High Sch)	IPO 2.2								x
	2.3								x
	2.4								x
	CO 7								x
	8							x	
	9								x
	10								x
	TPO 3.0								x
	IPO 3.1								x
	3.2								x
	3.3								x
	3.4								x
	CO 11								x
	12								x
	13								x
	14								x
	TPO 3.0b								x
	4.0		x						x
Physics	TPO 1.0							x	
	IPO 1.1a		x						
	1.1c -1.1f								x
	CO 1, 2								x

Course/ Subject Area	Objective Number	á la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Physics	IPO 1.2a,b		x						x
	1.2c,d,f								x
	CO 3								
	IPO 1.3a,b		x						x
	1.3c – f								x
	CO 4								
	IPO 1.4a								x
	1.4b		x		x				x
	1.4c								
	1.4d								x
	1.4e-f		x						x
	CO 5					x			
	IPO 1.5a		x						
	1.5b		x		x				
	1.5 c-d								
	1.5 e								x
	TPO 2.0						x		x
	IPO 2.1		x						x
	2.1a		x						
	2.1b								
	2.1c				x				
	2.1d		x						x
	2.2		x						

Course/ Subject Area	Objective Number	✓ a la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Physics	2.2a, c, d		x						
	2.2b		x	x					
	2.3								x
	2.3a, d		x						
	2.3b		x		x				
	2.3c								x
	2.4		x						
	2.4a, d		x						
	2.4 b		x						
	CO 8				x				
	IPO 3.1								
	3.1a		x						x
	3.1b		x						x
	3.1c, d				x				
	3.2								x
	3.2a		x						x
	3.2b		x						
	3.2c, d				x				
	3.3								x
	3.3a		x						x
	3.3b		x		x				
	3.3c-d								x

Course/ Subject Area	Objective Number	✓ a la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Physics	3.3c–d								x
	3.4								x
	3.4a		x						
	3.4b		x		x				
	3.4c								x
	3.4d						x		x
	TPO 4.0					x			
	CO 9			x					
	IPO 4.1a		x						
	4.1b		x		x				
	4.1c–d								x
	CO 10								x
	IPO 4.2a		x						
	4.2b		x		x				
	4.2 c–d								x
	CO 11								x
	IPO 4.3a		x						
	4.3 c–d								x
	CO 12								x
	IPO 4.4a		x						
	4.4b		x		x				
	4.4c–e								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Physics	TPO 5.0							x	x
	CO 13		x						
	IPO 5.1a-d								x
	CO 14					x	x	x	
	IPO 5.2a		x						
	5.2b		x		x				
	5.2 c-d								x
	CO 15					x		x	
	IPO 5.3a		x						
	5.3b, d		x		x				
	5.3c								x
	CO 16					x		x	
	IPO 5.4a		x						
	5.4b		x		x				
	5.4c-d								x
	TPO 6.0		x						
	CO 7								x
	IPO 2.5a		x						
	2.5b		x		x				
	2.5 c-d								x

Course/ Subject Area	Objective Number	à la Mager 4 parts	Clarity	Unrealistic Minimum Standards	Elimination of Objective Desirable	Change of Sequence Desirable	Prerequisites Identified	Inappropriate Cognitive Level	No Revision Recommended
Chemistry	TPO 1.0								x
	IPO 1.1		x						
	1.2		x		x				
	1.3		x						
	1.4		x						
	1.5								
	CO 1								x
	2								x
	TPO 2.0							x	
	IPO 2.1		x						
	2.2		x		x				
	2.3 -2.5								x
	CO 3							x	
	4							x	
	TPO 3.0								x
	IPO 3.1-3.4		x						
	3.5								x
	CO 5							x	
	6							x	
	7							x	
	8							x	
	9							x	

SUMMARY OF RESEARCH EXPERIMENT

ACHIEVEMENT OF THE RESEARCH OBJECTIVES

Curtailment of funds made it virtually impossible to attain the research objectives as described in the original proposal. The extent to which each was attained is described below.

TO ESTABLISH IN ALL COURSES AT THE SECONDARY LEVEL A CURRICULUM MODEL OF BEHAVIORAL OBJECTIVES, WHICH ARE APPROVED BY VARIOUS EXPERTS, TESTED AGAINST RELEVANT CRITERIA, AND TRIED OUT IN ACTUAL CLASSROOM SITUATIONS

A curriculum model of behavioral objectives was established for all subject area disciplines, but limited funds prevented creation of such a model for all courses. The objectives defined were, in general, approved by various experts.[1] It should be noted that each expert evaluated the objectives in terms of his personal philosophy and background and that these were not necessarily consistent with those of the Bloomfield Hills Schools.

Classroom field tests, too, have been completed for each objective defined. Field-test results indicated a need for revisions in the level of accuracy demanded, sequence, and time estimated to fulfill various objectives.

TO DISSEMINATE INFORMATION WITHIN THE ES'70 NETWORK OF SCHOOLS WITH PRIORITIES GIVEN TO THE SCHOOLS WILLING TO IMPLEMENT THIS PROGRAM WHOLLY OR SEGMENTALIZED. THE ES'70 SCHOOLS THROUGH THE SERVICES OF THE OFFICE OF EDUCATION AND THE E. F. SHELLEY CONSULTING FIRM WOULD ASSIST IN FURTHERING COMMUNICATION AT THE NATIONAL LEVEL FOR AWARENESS BY EDUCATORS OF THE SOPHISTICATION OF AVAILABLE BEHAVIORAL OBJECTIVES

Copies of all interim progress reports have been disseminated to the ES '70 Network of Schools, and several members of the network have availed themselves of the opportunity to visit Bloomfield Hills.

TO MAKE THIS STUDY MEANINGFUL TO THE STATE DEPARTMENT OF EDUCATION FOR STIMULATING GREATER COMMUNICATION AND COOPERATION BETWEEN MICHIGAN'S OTHER LOCAL SCHOOL DISTRICTS AND BLOOMFIELD HILLS

Throughout the study communication was maintained with the Michigan State Department of Education. Members from each subject area discipline attended orientation sessions on the curriculum project, visited the schools to see the program in operation, and, in some cases, served as consultants to evaluate the objectives.

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[1] The reader is referred to the consultant's evaluations on pp. 216 through 291.

TO BRING THE LOCAL COMMUNITY THE TOTAL CURRICULUM DESIGN AS IT IS REFLECTED IN INDIVIDUAL PROGRAMS AND AS THE BEHAVIORAL OBJECTIVES HAVE BEEN ASSESSED AND REVISED FOR OFFERING COMPLETE ARTICULATION HORIZONTALLY AND FOR ORDERING SEQUENTIAL PATTERNS VERTICALLY

A number of orientation sessions have been conducted with administration and staff in Bloomfield Hills as well as with other administrators.

TO ASSESS THE DESIGN OF THE PRESENT BEHAVIORAL OBJECTIVES IN ALL COURSES AT THE SECONDARY LEVEL

The design of all the available behavioral objectives for secondary courses was critiqued by the outside experts as well as by our local staff. Comments from outside consultants ranged from strongly positive to slightly negative. In general, the negative comments were expressions of concern over the complicated language involved. Some consultants felt that the objectives could have been expressed more simply and meaningfully if a uniform design format had not been followed.

TO OBTAIN DATA FROM OTHER AGENCIES WHICH HAVE BEEN INVOLVED IN THE CONSTRUCTION OF BEHAVIORAL OBJECTIVES AND/OR OTHER RELATED CONCERNS INCLUDING RESEARCH UNDERTAKINGS

In order to design the study for the Bureau of Research of the U.S. Office of Education contacts were made with agencies, groups, and individuals. Dr. Robert Morgan visited Bloomfield Hills to assess the environment and professional competency for carrying out a research program. Later Dr. Mary Lee Hurt came to Bloomfield Hills to visit and observe the experimental schools and to become acquainted with the methods used for performing the research.

During the research period complementary programs were brought to the attention of members of the Bloomfield Hills Staff. The Atlanta School System was revising its high-school curriculum in terms of assessable behavioral objectives. Dr. Bruce Tuckman's program, SCOPE, which in part, is refining and testing a scheme for reorganizing educational objectives in terms of the behavioral process was shared with local project personnel.

Communication with New York Institute of Technology provided information pertaining to management by objectives as individualization was accomplished for the United States Naval Academy. The Instructional Objectives Exchange at the University of California has been involved with operationally stated instructional objectives. Dr. W. James Popham, Project Director for the Exchange, is aware of the role of Bloomfield Hills in constructing behavioral objectives which will contribute to the development of the "organic" curriculum.

Dr. Ronald Urich, Wayne State University, and Dr. Edward Bantel, Oakland University, assumed responsibilities for working directly with the research participants as well as offering consultive services to the project leaders and other district representatives.

These are examples of projects investigated for information. In addition, materials in the Bibliography[1] provided another resource which has been extremely useful to the project participants.

TO CONSTRUCT CRITERIA FOR THE EVALUATION OF THE DESIGN

TO TEST THE OBJECTIVES AGAINST THE EVALUATIVE CRITERIA AND/OR THE SPECIFICATIONS OF THE CURRICULUM DESIGN

These objectives were attained to the extent that behavioral objectives for the subject matter disciplines were available. The criteria used are identified in both the task analysis which appears at the beginning of this report and on the evaluation forms completed by consultants.

TO CROSS-INDEX THE BEHAVIORAL OBJECTIVES WITHOUT REGARD TO DISCIPLINE WHENEVER EXPEDIENT AS INDICATED BY THE TEST ANALYSIS

The extent to which this objective was accomplished is minimal. While behavioral objectives were cross-indexed in terms of cognitive level, few were cross-indexed in terms of content or skill. Notable exceptions would be found with communication and inquiry skills which permeated nearly all disciplines.

TO INVENTORY PUBLISHED RESOURCE MATERIALS WHICH COME TO THE ATTENTION OF THE RESEARCHERS IN EFFECTING THE TEST ANALYSES OF OBJECTIVE 4

This objective was accomplished insofar as the published resource materials were available within the district. No attempt was made to gather all materials on the market for purposes of coding them to the stated behavioral objectives for each course.

TO DETERMINE THE VALIDITY AND RELIABILITY OF COURSE PREREQUISITES

This objective was not even attempted. Due to budget curtailments data processing was not available and sorting through the thousands or records to retrieve the necessary data manually was regarded as a futile task.

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[1] Bibliography, p. 334.

RELATIONSHIPS OF STUDY TO CURRICULUM INNOVATION, REVISION AND/OR CHANGE

The following set of assumptions permeated all aspects of the curriculum study:

1. Persons who are to be affected by decisions should be involved in making those decisions.

2. Involvement in the decision-making process tends to build personal and task commitment.

3. Changes in teacher behavior must result from felt needs on the part of the teacher(s).

4. The development of an effective problem-solving team requires a focus on human interaction processes and role clarifications of members as well as direct focus on the problem(s).

5. The process of change is generally slow and must overcome barriers and resistance to changing.

6. The effectiveness of change activities on the part of teachers or teacher groups will be enhanced if those advocating the change (parents, students, administrators, board members) are involved as participants. That is, people who work together should have an opportunity to learn together.

7. In order to maintain inservice education as a continuous process, leadership for designing and conducting inservice education activities must be drawn from or developed from among those who are a part of the local situation.

8. Effective curriculum leaders must possess both conceptual resources and process skills to effectively release the potential of others.

9. Effective problem-solving necessitates a sequence of activities such as the following:

    a. Identification of a problem
    b. Study of relevant research
    c. Confrontation of knowledge based on the research
    d. Development of generalizations derived from the knowledge confrontation
    e. Determination of curriculum implications of the generalizations
    f. Determination of alternative courses of action in terms of the implications
    g. Field-testing of one or more of the suggested courses of action
    h. Evaluation of field-test results with recommendations for future study

10. Inservice education programs should provide for appropriate continuing support of efforts the participants make to use the inservice training experiences.

With few exceptions teachers and administrators were directly involved in the decision-making process whenever decisions affected them. Noticeable differences can still be found between participants and non-participants even in buildings where the program was implemented. The differences are evidenced through such things as attendance at and participation in staff curriculum meetings, willingness to develop materials needed, etc. In non-participating schools the situation is even worse. Reactions range all the way from extreme negativism (possibly fear of being forced into a program they don't want) to strong, positive support. Generally, there seems to be a feeling in non-participating schools that the continuous progress schools get all the money and everything they want while other schools get nothing. Such schools are also negative about the failure of the continuous progress schools to share their materials with them. (They don't believe that the proposal was not for the development and reproduction of student materials - that these had to come from individual building budgets.)

Assumptions 7-10 point to the need for utilization of local leadership to maintain appropriate continuing support. It was for these reasons that local teachers and administrators assumed such a large share of the responsibility in directing the efforts of the sub-groups. They provided the advantage of being available throughout periods of curriculum development and program implementation. While participants generally regarded the local group leaders as helpful, their effectiveness could probably have been enhanced if greater leadership training activities had been provided. An earlier start for group leaders or a scheduled training session each day should make a noticeable difference.

RELATIONSHIPS OF STUDY TO EFFICIENCY AND EFFECTIVENESS OF A CURRICULUM FOR INDIVIDUALIZING INSTRUCTION

This study, with its focus on behavioral objectives, was designed to structure a curriculum which would enable a student to progress at a rate and level commensurate with his abilities. Included in the design were the following components:

1. A set of behavioral objectives, specifying precisely what a student needed to attain in order to receive credit in each course
2. A pretest for each objective to determine whether a student could demonstrate the requirements of the objective prior to instruction
3. A post-test for each objective to determine if a student had successfully met the requirements of the objective (test forms include pencil-and-paper, oral, projects, demonstrations, etc.).
4. A list of commercially prepared materials which meet the specifications of each objective

Implementing the foregoing in a field-test situation revealed a need for a highly sophisticated record-keeping system to keep track of each student's individual progress. Various types of class progress charts and individual pupil profiles evolved. To date no satisfactory solution to this problem has been found. All systems yet devised necessitate a heavy clerical load on teachers and make it virtually impossible to retrieve desired data. A computer management system holds some possibilities, but curtailment of funds made it impossible to test the feasibility of this means.

While this study made marked progress in effectively individualizing instruction, it could hardly claim great efficiency. The system now is cumbersome and almost defies management. Much work is still needed in this area.

IMPLICATIONS OF THE RESULTS OF THE STUDY ON EDUCATION

The results of the Bloomfield Hills study have many implications for education in general. They demonstrate that staff members at a local level have the potential for defining quality behavioral objectives. The results of the evaluations by outside consultants clearly indicate this.

Furthermore, the results indicate that, without locking teachers and/or students into a rigid system which forces all into the same mold, it is possible to specify a major portion of a curriculum in behavioral objectives, arrange these objectives in a sequence, and allow students to progress through the sequence as rapidly as they are able. Both teachers and students are offered a wide range of choices in methods and materials to fulfill the stated objectives and, in some cases, students have a choice of which objectives they'll fulfill or to specify their own objectives subject to the approval of designated personnel.

Implementation of the Bloomfield Hills program revealed that many students could function with a minimum amount of teacher direction and could assume much responsibility for their own learning. Further, test results and periodic quality control checks revealed that a number of students were capable of achieving far beyond the courses typically taught at given levels while others were totally incapable of functioning successfully in so-called grade level courses (Algebra I in 9th grade, etc.).

Finally, the study indicated that children who followed a specific cognitive sequence could demonstrate required knowledge or skills more efficiently than students following a random sequence. It was for this reason that the curriculum was evaluated for cognitive balance to insure that students experienced higher level thinking skills such as predicting and hypothesizing.

RECOMMENDATIONS FOR FURTHER RESEARCH

Subjectively, I would rate this study as highly successful-- especially when one considers the curtailment of funds. Much research, however, is still needed in many areas.

My first priority would be a feasibility study of computer management possibilities. It is impossible to expect teachers to function as human computers over an extended period of time. A management system would make it possible to retrieve data on such things as:

1. Relative effectiveness of various media
2. Relative effectiveness of various learning experiences
3. The success of low IQ's in performing higher level cognitive tasks

My second big priority would be research on the effectiveness of various types of inservice models. At this point colleges and universities are not preparing teachers to implement the type of program developed in this study. Secondary teachers, especially, are ill-prepared to handle an individualized instructional program. Moreover, students and parents, too, must be oriented to a totally new philosophy of education and instructional program.

APPENDIX A

BASIC ASSUMPTIONS CONCERNING CURRICULUM CHANGE

BASIC ASSUMPTIONS CONCERNING CURRICULUM CHANGE

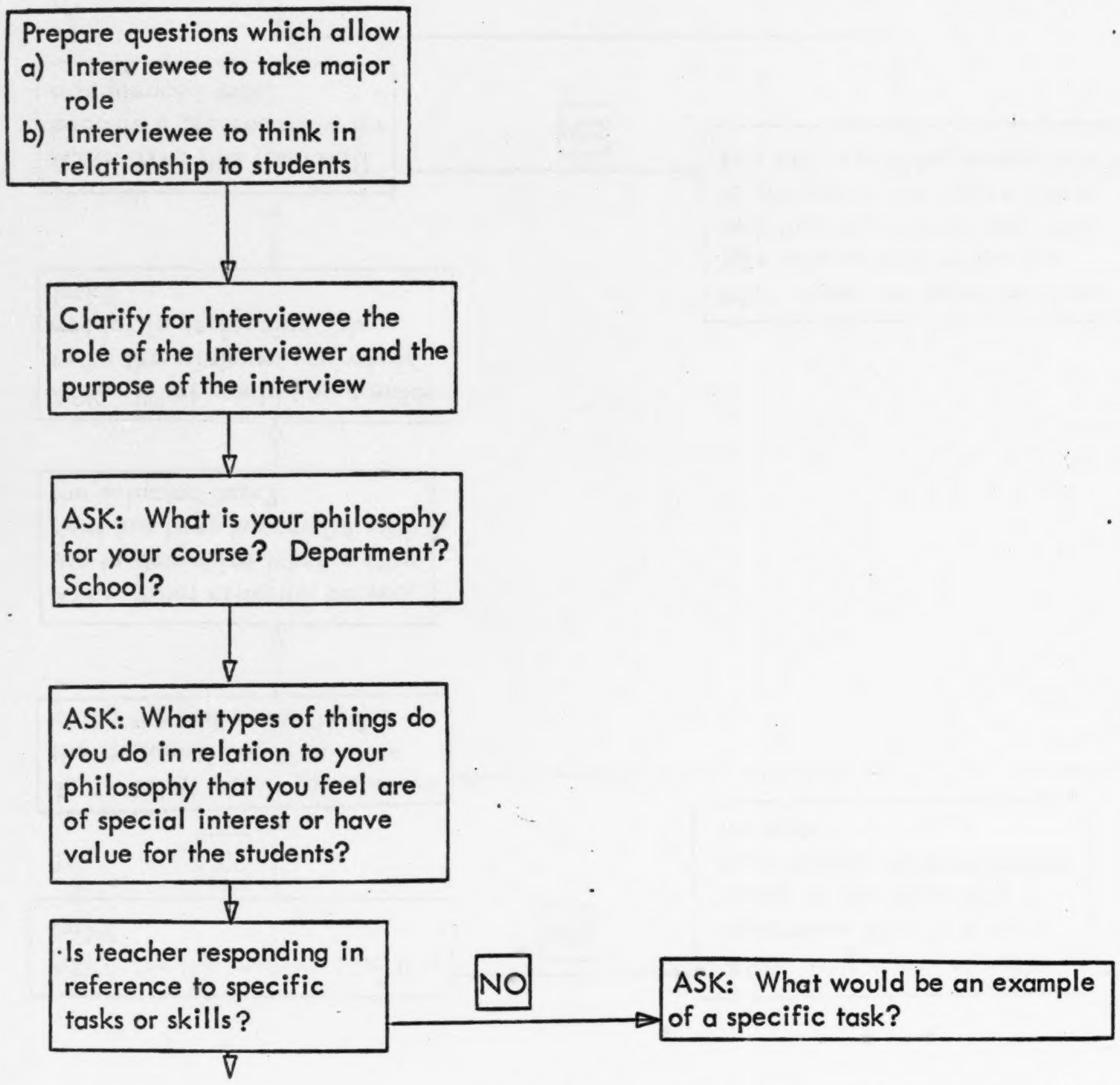
1. THE PROCESS OF CHANGE IS GENERALLY SLOW AND MUST OVERCOME BARRIERS AND RESISTANCE TO CHANGING.
2. CURRICULUM CHANGE IS EFFECTIVE TO THE DEGREE THAT POSITIVE GROUP INTERACTION IS ESTABLISHED WITHIN THE CHANGE GROUP.
3. CURRICULUM CHANGE IS EFFECTIVE TO THE DEGREE THAT TEACHERS PERCEIVE THE NEED FOR CHANGE.
4. CURRICULUM CHANGE OFTEN NECESSITATES RELEARNING, AND SHOULD, THEREFORE, BE DIRECTED TOWARD HELPING TEACHERS IMPROVE PROFESSIONAL ATTITUDES AND UNDERSTANDINGS AS WELL AS ESTABLISHED TEACHING PATTERNS.
5. ACCURATE AND VARIED MEANS OF COMMUNICATION ARE IMPORTANT MEANS OF CURRICULUM CHANGE.
6. CHANGE MUST BE ACCEPTABLE AND RELEVANT TO THOSE EXPECTED TO PARTICIPATE IN THE CHANGE PROCESS. THE CHANGE PROCESS IS MOST EFFICIENT AND EFFECTIVE WHEN THE TARGET GROUP IS INVOLVED IN ALL PHASES OF THE CHANGE PROCESS.

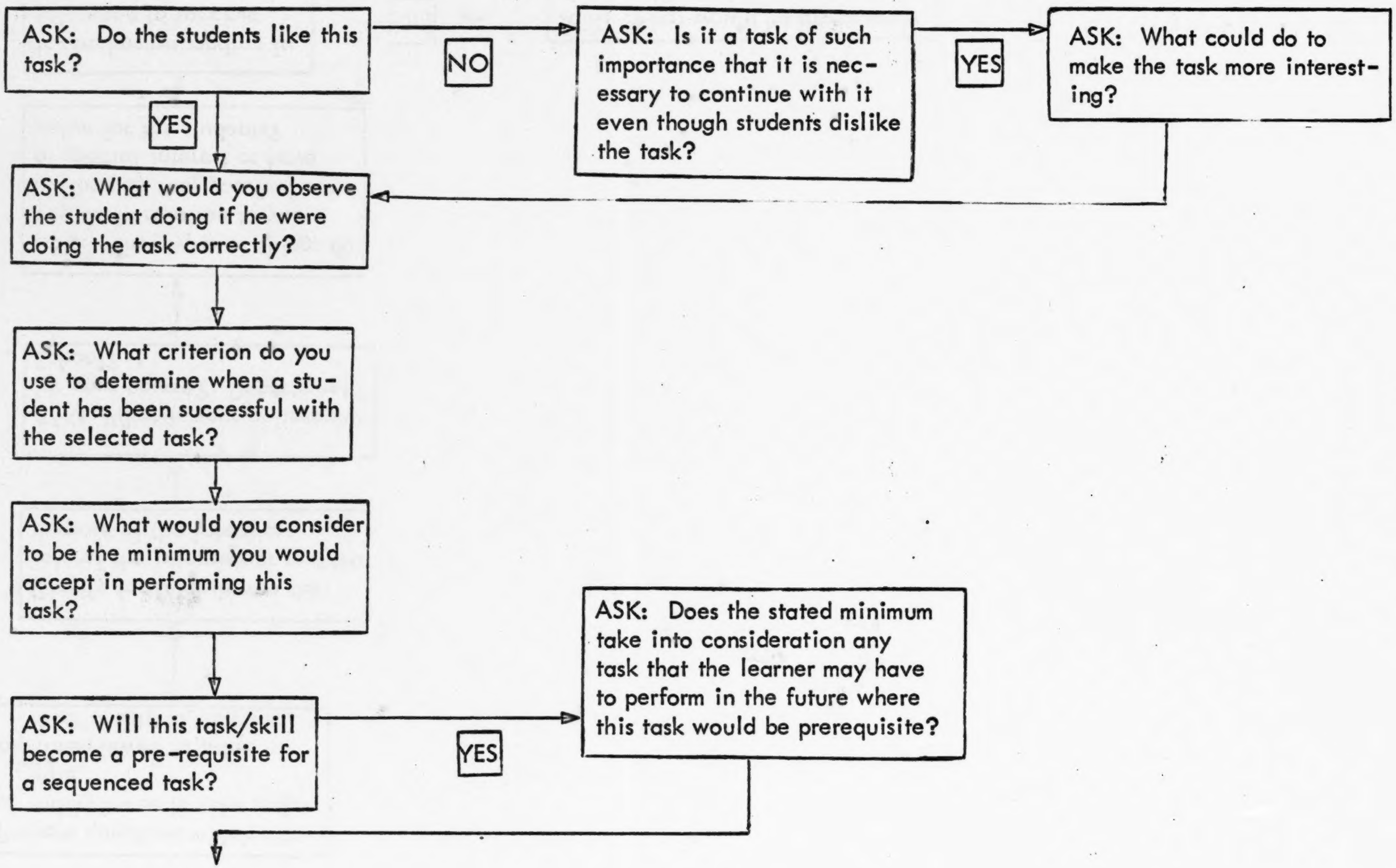
IMPLICATIONS FOR CURRICULUM STUDY GROUP:

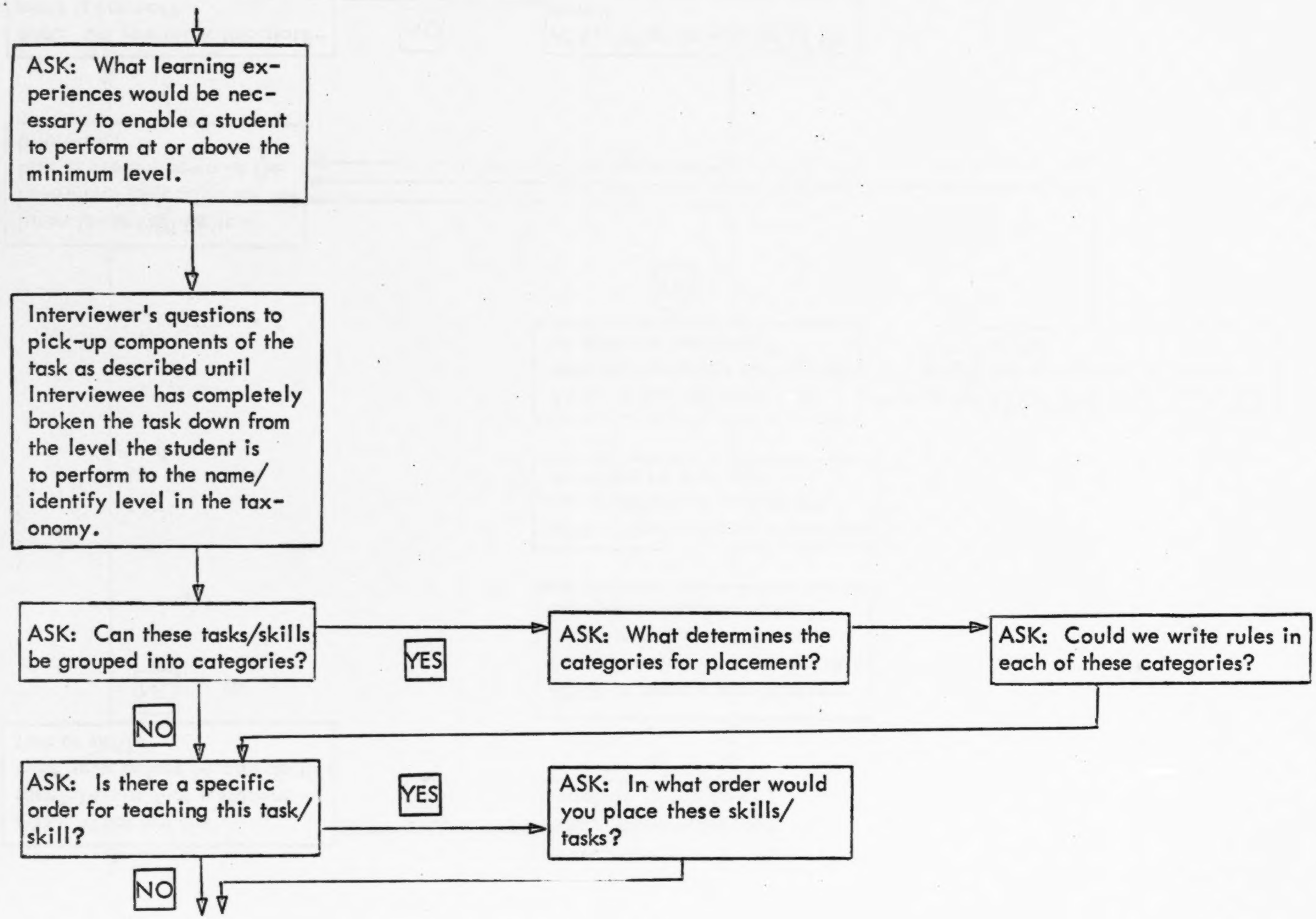
APPENDIX B

METHOD FOR TASK ANALYSIS

APPENDIX B
METHOD FOR TASK ANALYSIS


Prepare questions which allow
a) Interviewee to take major role
b) Interviewee to think in relationship to students
Clarify for Interviewee the role of the Interviewer and the purpose of the interview
ASK: What is your philosophy for your course? Department? School?
ASK: What types of things do you do in relation to your philosophy that you feel are of special interest or have value for the students?
Is teacher responding in reference to specific tasks or skills?
NO
ASK: What would be an example of a specific task?


ASK: Do the students like this task?
NO
ASK: Is it a task of such importance that it is necessary to continue with it even though students dislike the task?
YES
ASK: What could do to make the task more interesting?
YES
ASK: What would you observe the student doing if he were doing the task correctly?
ASK: What criterion do you use to determine when a student has been successful with the selected task?
ASK: What would you consider to be the minimum you would accept in performing this task?
ASK: Will this task/skill become a pre-requisite for a sequenced task?
YES
ASK: Does the stated minimum take into consideration any task that the learner may have to perform in the future where this task would be prerequisite?



ASK: What learning experiences would be necessary to enable a student to perform at or above the minimum level.

Interviewer's questions to pick-up components of the task as described until Interviewee has completely broken the task down from the level the student is to perform to the name/identify level in the taxonomy.

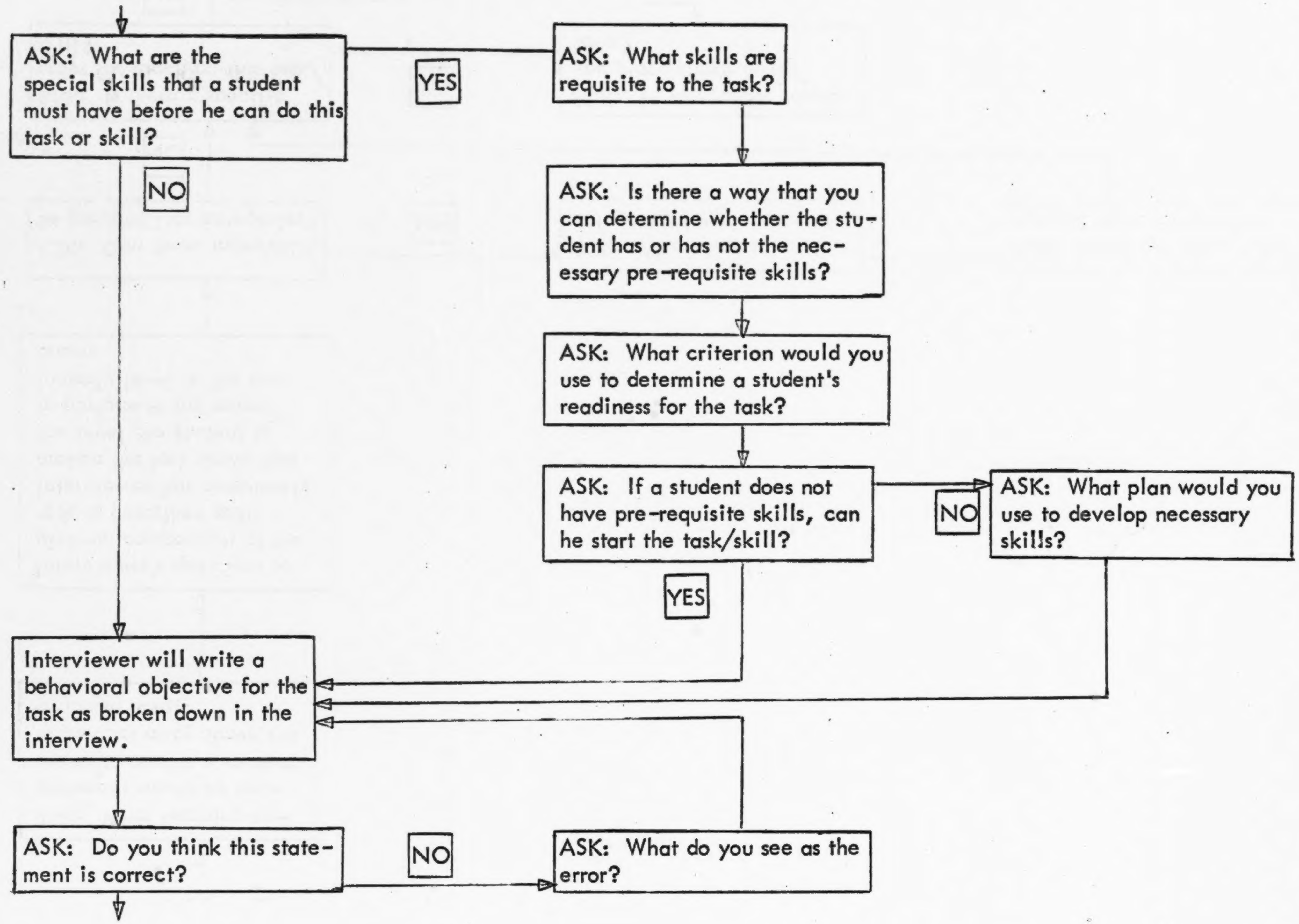
ASK: Can these tasks/skills be grouped into categories?

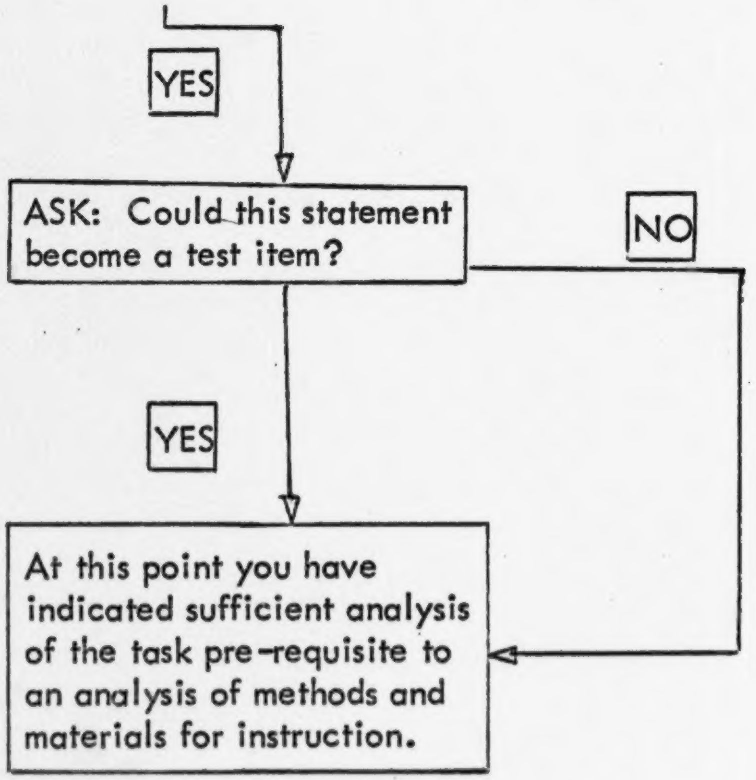
ASK: What determines the categories for placement?

ASK: Could we write rules in each of these categories?

ASK: Is there a specific order for teaching this task/skill?

ASK: In what order would you place these skills/tasks?


ASK: What are the special skills that a student must have before he can do this task or skill?
YES
ASK: What skills are requisite to the task?
ASK: Is there a way that you can determine whether the student has or has not the necessary pre-requisite skills?
ASK: What criterion would you use to determine a student's readiness for the task?
ASK: If a student does not have pre-requisite skills, can he start the task/skill?
NO
ASK: What plan would you use to develop necessary skills?
YES
NO
Interviewer will write a behavioral objective for the task as broken down in the interview.
ASK: Do you think this statement is correct?
NO
ASK: What do you see as the error?


YES
ASK: Could this statement become a test item?
NO
YES
At this point you have indicated sufficient analysis of the task pre-requisite to an analysis of methods and materials for instruction.

APPENDIX C

QUALITY-CONTROL CHECK - 1967-68

QUALITY-CONTROL CHECK - LAHSER HIGH SCHOOL

December 1967

Course	% Pretests	% Post-tests	% Student Packet	Avail of Mat'ls	Adeq. of Mat'ls	Profiles	Have you overcome Prob. of Individ. Instruction	Course Revisions	Add'l Courses Needed	Schedule	General Comments or Recommendations
Accounting	100%	50%	50%	All	Need more levels	yes	largely overcome	expand to higher levels	more needed	ok	student finance office (for practical application)
Consumer Education	40	40	40	40	Need more levels	yes	room for improvement			ok	educate counselors as to nature of class
Data Processing	70	50	70	100% avail. need to be organized in IPO's	Adequate	yes	largely overcome need to work on remedial strategies	subdivide skills to better meet student's interest clerical, secretarial, etc.	no	need 100 min. periods	educate counselors students were scheduled in without prequisites. need greater coordinati with other subjects
Basic Typewriting	100% need more forms	10% more forms	100	100% need more variety slides, etc.	fairly good room for improvement	yes	yes - get teacher roller skates			each student needs 275 min per week	coordinate with other disciplines
Advanced Typewriting	100%	35	35	Avail. but need to be organized	need more advanced remedial mat'ls	yes	yes, need more organ. to help student when problem occurs		need more advanced materials	275 min/wk per student	
Shorthand	100%	33	0	Adequate	ok	yes	yes, diff. in getting students to accept their responsibilities	more definite prerequisites	coordinate adv. typing & shorthand	100 min. too long	
Algebra I	100%	100%	100%	All	Adequate	Yes	Yes	None (now)		Need 60 min. classes	Room is not suitable (Lahser)
Algebra II	100%	100%	100%	All	Must be supplemented	Yes	Yes	None (now)		Need 60 min. classes	Work on teacher prepare instructional materials
Trigonometry	100%	100%	100%	All	Adequate must be supplemented	Yes	Yes	Rewrite TPO #3	Yes MEA	60 minute classes	Rewrite entire math sequence, integrating trig., algebra, & geometr
Geometry	100%	100%	100%	Need to be prepared	Adequate must be supplemented	Yes	Yes	Rewrite TPO's 1-3		60 min. classes	Work on teacher prepared instructional materials

QUALITY-CONTROL CHECK - LAHSER HIGH SCHOOL (Cont.)

December 1967

Course	% Pretests	% Post-tests	% Student Packets	Avail of Mat'ls	Adeq. of Mat'ls	Profiles	Have you overcome Prob. of Individ. Instruction	Course Revisions	Add'l Courses Needed	Schedule	General Comments or Recommendations
Math Concepts	6%	9%	6%	tchr. 10% Comm. 70%.	Not very adequate	Yes 60%	Improve. needed lack packets & tests	Revising as needed	Yes, something between Math Concepts & Algebra	Yes	Need more logistical support, less philosophy difficult to carry out routine, mechanical procedures
Basic Electronics	9%	9%	0%	tchr. 25% Comm. 75%	Very inadequate	Most Yes	No, not at all	Can't answer	Yes, hobby type	Yes, 2 classes overlap creates crowd.	Reschedule--Logistic (mechanical) support Help from one who's taught electronics
Engineering Graphics	50%	0%	100% 90% need revise.	Need to develop AV	Poor	Progress charts only	No, room problems	Yes, probably too general	Yes	No, get rid of Lib. Labs	Need room & files and curriculum revision time
Architectural Drafting	0%	0%	50%	Little comm. Need tchr.	Very inadequate	progress charts only	No, room problems	Switch 2.4 and 2.5	Yes	No, need more time/period	Curriculum time to prepare multi-levels Time to prepare non-commercial mat'ls.
Material Processing - Power Technology	0%	0%	100% needs revise	20%	Fairly adequate	Progress charts only	Not quite, lack light & heat	More tapes, visual correl. to art	Yes (occup. Mat'ls)	Not adequate	Coord. IE and Art Need at least 3 learning levels
Physical Education	75%	75%	5%	75% written, however only 5% avail. to tchr.	Adequate, needs improve. in relation to content vehicles	Progress charts only	50/50--lack of materials etc.	Re-define sequence of skills at J.H./S.H. levels	Yes--Foundations of P.E.	High School Yes	Redefining IPO/content vehicle--relationship, sequence. Need male swimming person. Full-time mane--less one & two period teachers.
Physics	0%	0%	0%	Comm. avail.		Mostly no	No	Background needs strengthening		want tradition schedule	Time to work on Mat'ls.
Chemistry	50%	50%	50%	Comm. avail.		Mainly no	No	Background needs strengthening	Earth science	traditional schedule	Time to work on Mat'ls
Biology I	100%	100%	100%	100%	Yes	?	Some	Background needs strengthening	Photog. Astronomy	traditional schedule	Time to work on Mat'ls

QUALITY-CONTROL CHECK - LAHSER HIGH SCHOOL (Cont.)

December 1967

Course		% Pretests	% Post-tests	% Student Packets	Avail of Mat'ls	Adeq. of Mat'ls	Profiles	Have you overcome Prob. of Individ. Instruction	Course Revisions	Add'l Courses Needed	Schedule	General Comments or Recommendations
Biology	II	0%	0%	0%	Some	Not done	Mainly no	Some	Background needs strengthening		traditional schedule	Time to work on Mat'ls
Spanish	I II III	40% 40% 0%	40% 40% 0%	40% 40% 0%	Tapes & workbooks in January	Lack AV Equipment	?	Some			large classes	Lack AV needed to individualize F.L. Large classes make difficult (might use audio notebooks)
German	I II	0% 0%	0% 0%	8% 0%	Some mat'ls will be available in January	Lack books & AV	NO	No, teaching conventionally			large classes	No C.P. 3 days per week
French	I II III	20% 8% 0%	20% 8% 0%	20% 8% 0%	Comm. mat'ls not in (Jan. 68)	Lack mat'ls & AV	No	Limited			large classes lack equip.	Same as other F.L. recommend re-doing entire schedule
Latin	I II	15% ?	15% ?	15% ?	Lack AV		No	Yes, within limitations			large classes 2 levels	Same as other F.L. recommend re-doing entire schedule
Humanities		22% Need rewriting	22%	22%	Need more Supplemental	Comm. mat'ls avail. tchrs. making mat'ls	Some	Some getting better	Whole thing needs revising	Develop. last 3 sem. many possibilities	100 minutes satisfactory	Time to do everything Some IPO's missing close look at prerequisites.

QUALITY-CONTROL CHECK - WAY ELEMENTARY SCHOOL

December, 1967

	Science	Social Studies	Math	Reading	Writing	Oral	Listening Skills	Research Location
% Pretest	0	None	85%	Gr.P-8,1.2,1.6, 1.13,2.0, 3.0,4.0,7.0, 9.0,12.0, 15.0,19.0	None	NOne	No	No
% Post-tests	primary 85% Inter. 50%	few — map skills only	85%	1 form per level per skill some unsatisfactory	one form per skill	None	No	No
% Student Packets	85-90% primary direct. put on language masters	none — tchr. packets only	85%	no packets	none	None	No	No
Avail. of materials	books-ok short on material and AV	Inadequate 'largely single text for student	85%	cross-ref. guide of available commercial mat. complete PP-6 Nongraded-8	Roberts only insufficient quantities	None	few tapes developed for primary children	some in English bks., some trans-parancies
Adeq. of materials	difficult to deter-mine, many not tested	depends on teacher no student materials	generally ok need more supplemental & enrich. activities	insufficient quantities of material	very inadequate		Inadequate	depends upon librarian at present
Profiles	generally no	no	yes	yes-through cross experi-ence guide	no	No	No	No
Have you overcome Problmes of Indiv. Instruction	see #5	depends on tchr. Individ. occurs through use of methods and materials	fairly well	major problems result from lack of materials	depends on tchr. some using children's writing as the basis for teaching highly individualized	No	No	works with student on individ. but have no organized program

QUALITY-CONTROL CHECK - WAY ELEMENTARY SCHOOL (Cont.)

December, 1967

	Science	Social Studies	Math	Reading	Writing	Oral	Listening Skills	Research Location
Course Revisions	pack-revise tchr. in-service activities fairly self-direct. study guides need to tie concepts & activities together		see #5	supplementary and enrich. activities				
courses needed								
Schedule								
General Comments or Recommend.		more materials comm.& tchr. prepared SRA-Map & Globe Skill SRA Graphs & Pictures S.B. Picture Packets, Teacher In-service SCSSP Mat'ls	work IPO by IPO sequence Supp.& enrich. activities some primary worksheets & organization of primary mat by IPO	develop student packets need pre-& post tests teacher training	evaluation instruments (pre & post) student materials commercial mat. coded for writing skills teacher in-service	suggestion from tchrs for develop. oral skills, evaluating student progress	SRA Listen. Skillbuilders commercial mat. time for develop. tapes	Develop pretests which skills to be taught in class & which in library student mat. tchr. in-service on use of library

QUALITY-CONTROL CHECK - EAST HILLS JUNIOR HIGH

February 1968

Course	% Pretests	% Post-tests	% Student Packets	Avail of Mat'ls	Adeq. of Mat'ls	Profiles	Have your overcome Prob. of Individual Instruction	Course Revisions	Add'l Courses Needed	Schedule	General Comments or Recommendations
Algebra (9th grade)	100%	100%	100%	70%	mat. don't meet needs of many av. & below av.	Yes	generally no students lack initiative & motivation to think through areas of diff. give up to easy results in many not working	good course, only revise. to be made would involve prob assign. within obj	?	change I request is that of sched. student with classmates for math clas	Lengthen the day from 24 hours to 48 hours
Math (7th)	84%	50%	50% dn. 50% ½ done	more text mat. needed. no tapes do have basic text coverage for all object. not other mat. coded in	Range is good see #7	Yes-but last springs test. Inadequat. revamp. profile sheet or kind of infor. or	need emphasis on mat. for below average more good explanations (tapes,etc.) to go with obj.	reevaluating & rewriting of obj. with eye to seq. work loads imply. by obj.,revise student packets	No	against math twice a day for 7th grade	need another workshop to prepare & refine mat. Need back to back conf. periods in the building--better comm. between teachers of same subject
Art	All	None	All	All student 1/3 teacher	all need to be revised	Yes	Indiv. but no group work at all	cut out majority of minimum obj.	No	not adequate for art room	teachers teaching three different ways
Physical Education		All 1st semest.	we have none.	limited	poor	Yes	Yes	prepare more content orientated materials	No	No (Scheduling)	Separate girls & boys at least 80% of time
Science (8th grade)	100%	33%	100% only 95% printed	several tapes & quizzes to be prepared yet	minor revisions & several addit. e.g. rewriting of worksheets, review of seq. in some places, insert. sev. act. to provide bette sequence & give more informatio	Yes	quite well except for clas size in several instances	suggested in #5	some students have had a sketchy train in ele.scienc 7th grade science work should help this year	prefer a schedule based on sections. would give uniform meet. of classes- once a day rather than twice a day & none others length of class is good but diff. for some to have long attent. span	like a different schedule--no other comments

QUALITY-CONTROL CHECK - EAST HILLS JUNIOR HIGH (Cont.)

February 1968

Course	% Pretests	% Post-tests	% Student Packets	Avail of Mat'ls	Adeq. of Mat'ls	Profiles	Have you overcome Prob. of Individual Instruction	Course Revisions	Add'l Courses Needed	Schedule	General Comments or Recommendations
Drafting		70%	30% with draw.pkg.	I prepared all test. & IPO we need mat. such as pre & post-tests	mat. need rewrit & altered to better meet neec of student mat. don't cover enough subj.cont.	complet on each student	Yes	Industrial Ed. should be written in specific sub. areas with TPO's and IPO's in each subject	No	easier & smoother if students came 5 days as a group	Program can be success. Indiv. teachers must do the following & operate as team Discipline, class control, unity in handling students
Spanish		approx 1/3	approx. 1/3	some comm. mat. available & ordered but not here	materials are being written	No	No, we have been forced to indiv. too much due to schedule	1st,2nd,& 3rd yr. students shouldn't be in same classes meet with same class each day-requires group inter-action can't work orally with entire class	No	No	See #8
French		1/3	1/3	were in good shape here	mat. are adequat for 1st yr. but post & pre-tests are needed for 2nd and 3rd	Yes diagnost. infor.no	Indiv. too much in speaking skills student should be in same chapter for new vocab. It is almost impossible to even use small groups	1st,2nd,& 3rd yr. should not be in same class- studen who have 2 or more yrs. French in one group-better to see student with same class each day.	No	length fine but student with 2 hr. become bored	
Humanities (8th grade)	None	None	All on emergency basis	Same as #3	Same as #3	Yes	Yes	more attention given student's reading ability some films, better understanding of ways to handle mythology	Yes-reading	No-it is difficult to plan student activities	

QUALITY-CONTROL CHECK - EAST HILLS JUNIOR HIGH(Cont.)

February 1968

Course	% Pretests	% Post-tests	% Student Packets	Avail of Mat'ls	Adeq. of Mat'ls	Profiles	Have your overcome Prob. of Individual Instruction	Course Revisions	Add'l Courses Needed	Schedule	General Comments or Recommendations
Humanities (9th grade)	under revise	writin as we go	75% part. complete	somewhat ahead of the students	not entirely adequate for all-around prog.	only in our grade-books	No	revise mat. to a more varied and less sophisticated level		no magnificent time problems	materials are generally too literary too "high brow" for many of our students need more "human" Humanities Course
Speech	No	No	being changed completely	present prepared future ones will be ready for next semester	need some cartridge tape players (not recorders)	have profile but not very descript. will tell amount & quality of work	for the 1st semester, yes improvements will take time			Yes	

APPENDIX D

QUALITY-CONTROL CHECK - 1969

APPENDIX D
SUMMARY SHEET
QUALITY CONTROL CHECK

Lahser High School March 17, 1969

COURSE	# of Obj. & # in Behavorial Terms	Revisions Necessary in Course Objs.	Adequacy of Student Centered Materials	Revisions Necessary in Student Centered Materials	General Recommendations
HUMANITIES - SOCIAL STUDIES					
0100 Am.Cult.	30/		Packets for all written assignments Tapes most lectures	None indicated	Separate primary resp. for developing writing skills
	Revised Course 6/Sem.	Yes - not complete	All	All	
0101 Am. Cult.	15/15	Entire Course	Commerical material insufficient	Students need to purchase basics.	Do not allow Am.Cult. to duplicate existing classes in next year's course of study
		Vary widely from class to class	Material insufficient	More complete materials	
0102 European Studies	10/0	Not sure	Not totally adequate	More materials for lower level students	More individual materials
	8/6	No	6/ last 2 to be developed	Not familiar	None
	16/16	No	16 - not prepared	Extra material of different level	More time per class - Possible theme approach
0104 Russian Studies	10/10 (2 less than planned) -	Yes	No teacher packets -	Insufficient materials all types (certain subjects) Too much written papers	Longer daily period - Lighter class load - Less paper work
	All (unit tests also counted as objectives)	Being expanded into area studies	Insufficient commercial materials		

HUMANITIES - SOCIAL STUDIES (Cont'd)

0108 Con. Pol. Problems	15/7	?	Many not yet available	None	C/O's written before start of course
0109 Int. Hist. of W. Man	6/0	No	Every obj. needs them	--	Additional materials because of expansion
0106 Behavioral Science	6/6	Yes - added anthro-materials	All	4.0 - 6.0 should be revised in light of anthro-materials	--
HUMANITIES - LANGUAGE ARTS					
201 Creative Writing	8/8				
202 Cont. Lit.	Don't know	--	Not adequate student centered materials	More teacher co-op	--
203 W. Lit.					
204 Shakespeare	11/11	Yes - minimum performance standards need work	Some	Revise assignment sheets to match text	More materials
207 Journ.					
205 Speech	25/25	Yes - expansion to 1 year	1/2 of speech - must develop more	Retype teacher packets - Revise assignments based on student books	
206 Drama	?		Less than half of drama		

HUMANITIES - LANGUAGE ARTS (Cont'd)

210 Fund. Writing	18/?		Packets being written		
PHYSICAL EDUCATION					
0601	6/6 (24 Act.)	Yes - Standards for all 33 areas Evaluate in relation to 6 basics	None	List basic objs. satisfied by each skill in each content area	Course credit should come from: (1) Phy. fitness index test improvement; (2) Participation; (3) Skill; (4) Knowledge & appreciation
MATHEMATICS					
0401 Math. Con.	?/?	Yes See sheet	20% packet 75% packet	?	See sheet
0402 Alg. I	11/?	Yes More c/o's each covering less	None	More like Alg. II and Geom. More A.V. & more inst. in packet	
0403 Alg. II	12/? 9+4 tests	Only materials -- Improve correlation of test-to self-check-to-exercises No	Achievement levels not satisfied -- More develop. of multi-media None	Many - not listed here proofread Proofread	Complete enrichment mat. Some mat. suitable for whole group
0404 Geom.	12 + 4 tests 12	No	None	More A.V. packet 3 More inst. Pkt.5-9-10-11. Tests rewritten	Special projects for depth study
0405 Trig.	13/12 + final	Yes - needs more vigorous objs.	None	More A.V. Revise pkt. 1-7. Add inverse Trig. functions	More nontext supplemental material. Too cookbookish.

MATHEMATICS (Cont'd)

0406 El.Anal. I El.Anal. II	7/7	Need to add more objs.	Need more student centered materials - Decrease teacher paper work	Pkt. 2 & 10 Lessen degree Packet 6	———
0407 Calculus	9/0	Entire course	None	All need writing	
SCIENCE					
0501 H.S. Science	10/8	All objs. to lower specs.	None Poor text packet relationship	Change 2,3,7 8,9,10 not done More levels	Room improvement. Lower level instructional materials. Better teacher packet.
0502 Biol. I	18/18	Yes	95%	Too factual	
0503 Biol. II	30/30	No	1 level instruction	#2 and #3 lower instructional level - Additional materials	
0504 Chem.	21/21	Yes Time estimate inaccurate	21	Many packets need revision	
0505 Physics	16/0	Yes - Behavioral terms - development	None	Much revision	Need for retraining teacher
0506 Ad. Sci.					
FOREIGN LANGUAGE					
0301 French I	12/15	Yes - for non-college bound	11/12 are student centered	More oral work	No class over 20 students

FOREIGN LANGUAGE (Cont'd)

0302 French II	13/22	Yes More variety timeline change	Not all are student centered	Supplement text	
0303 French III	6/0	All	Teacher centered materials	Packets are not suitable means of instruction	Equipment shortage
0304 French IV	4/0	All	(SAME AS ABOVE)		
0311 Spanish I	14/0	Packets incomplete	8/14	Proofreading errors	
0312 Spanish II	9/0	Behaviorial terms	9 – But need high and low instructional levels	Revision necessary for variety	Time to write
0313 Spanish III	NOTHING				
0314 Spanish IV	NOTHING				
0321 German I	INCOMPLETE INFORMATION				
0322 German II		TEACHER			
0323 German III		HAS			
0324 German IV		BEEN ILL			
0331 Latin I	14/14	No	14 developed – Instructional level needs broadening	Some content change myths	Cultural supplement – Do not mix classes
0332 Latin II	15/15	Yes – minimum performance	12/15	Content change	

BUSINESS					
0701 Typing I	9/9	O.K.	Additional listening tapes		
	SEE RECOMMENDS IN DETAIL				
0701 Ad. Typing	7/7	O.K.	Additional listening tapes		
0702 Shorthand	23/23	O.K.	More tapes		More testing forms
0703 Accounting	17/17	Timeline adjustments	Lower range students need help	Lower range students need help	Question enrollment by students of limited ability
Con. Ed.	11/11	# of obj. need revision	More A.V. materials	More contemporary problems approach to c/o's	
0704 Data Proc.	11/11			More mathematical programmed materials	Advanced level needs preparation
HOME ECONOMICS					
0801 Foods	21/0	No			Some teacher and pupil confusion
0802 Clothing	10/0	No	More printed material commercially prepared	More A.V.	
0803 Int. Des.	20/0		Much A.V. needed	More resource material	Field trips
INDUSTRIAL EDUCATION					
0901 Draft Graphics Arch	27/27 17/17	Yes-timeline " "	New pockets needed Many pockets needed	Better testing Better testing	Inform counselors Material pur. Material pur.
0902 Pow. Tech.	30/24	Pre-test work - yes	Many pockets needed	Fluid power pocket exam	Inform counselors on course

INDUSTRIAL EDUCATION (Cont'd)

0903 Fab. Tech.	22/10	Yes	Many packets needed	Develop welding instruction sheet	Inform counselors on course
0904 Mach. Tech	40/0	Yes	Many packets needed	All need development	Unify class
0906 Elect.	40/0	Yes - All	Many materials needed	Pre-test development	Better information to prospective enrollees
0907 Mat. Proc.	40/0	Yes - particularly sequence and timelines	Many needed	All	(Same as above)
ART					
1001 2D & 3D	40/?	DIFFICULT TO SEPARATE OBJECTIVES IN THIS WAY -- SEE INSTRUCTORS NOTES			
1002 Graphics	16/	Yes	SOME ASSIGNMENTS APPEAR UNREALISTIC IN VIEW OF MATERIALS		

APPENDIX D
QUALITY CONTROL CHECK
EAST HILLS JUNIOR HIGH SCHOOL
March, 1969

COURSE	NO. OF COURSE OBJECTIVES IN BEHAVIORAL TERMS	NO. OF STUDENT PACKETS
ART		
7th-8th	5 of 16	5
9th	0 of ?	1/3 of course
BUSINESS		
Typing	7 of 7	7 of 7
Consumer Education	10 of 10	10 of 10
FOREIGN LANGUAGE		
Spanish	all	8 of 14
French	0	9 of 12
HOME ECONOMICS (taught traditionally)	0	0
HUMANITIES		
7th	26 of 26	All
8th	12 of 15	12 of 15
9th	31 of 36	31 of 36
INDUSTRIAL EDUCATION		
7th	4 of 15	4
8th-9th	2 of 20	2
MATHEMATICS		
7th - 8th	33 of 34	33 of 34
Alg. I	11 of 11	11 of 11
Alg. II	9 of 9	9 of 9
Math. Concepts	0	6

COURSE	NO. OF COURSE OBJECTIVES IN BEHAVIORAL TERMS	NO. OF STUDENT PACKETS
MUSIC		
General	All	
Choir	All	
Strings		
SCIENCE		
7th	17 of 19	17 of 19
8th	33 of 37	33 of 37
Biol. I	40 of 43	40 of 43
SPEECH	4 of 4	6 of 7

Note: Numbers do not reflect whether or not revisions have been recommended.

APPENDIX D
QUALITY CONTROL CHECK
WAY ELEMENTARY SCHOOL
March, 1969

SUBJECT	STATUS OF OBJECTIVES	STATUS OF STUDENT MATERIALS
COMMUNICATION	Completely defined	Available commercial materials have been coded to each skill. Some teachers have collected all appropriate pages and have set up folders for each skill. Others have developed special worksheets or Language Master lessons to develop the various skills.
MATHEMATICS	Completely defined	Available commercial materials have been coded to each skill. Packets have been developed for all but a few of the measurement skills (M23.0-M27.0). Since packets depend on the student's ability to read, they are used mainly at the intermediate (gr. 4-6) level, and more student-centered materials are yet to be developed at the primary level.
SCIENCE	Defined for all except C5.0, C6.0, E6.0, F4.0	Student-centered materials at the primary level need much revision. Packets still need to be developed for C4.0, C5.0, C6.0, F4.0 and G2.0
SOCIAL SCIENCE	All objectives need to be redefined in light of a humanities approach.	Many materials need to be developed. Most of those developed are for use at a third grade level.

Way School - Page 2.

SUBJECT	STATUS OF OBJECTIVES	STATUS OF STUDENT MATERIALS	
PHYSICAL EDUCATION	Completely defined	K-1	6 of 14 skills
		2nd	0 of 8 skills
		3rd	0 of 9 skills
		4th	0 of 5 skills
		5th	0 of 8 skills
		6th	0 of 12 skills

APPENDIX E

GLOSSARY OF TERMS

APPENDIX

Glossary of Terms
for the Bloomfield Hills Continuous-Progress Curriculum

Articulation

Articulation in curriculum refers to the fitting together of the otherwise disjointed subject area subdivisions to eliminate needless repetition of common skills and to cross-reference those skills which can be developed and/or fortified through two or more subject areas.

Behavioral Objectives

Behavioral objectives are objectives which describe specifically who is to perform a given task, what he is to do, the circumstances under which he is to demonstrate his performance, and finally, the minimum-performance standard which he must attain.

Continuous-Progress Program

Continuous progress focuses on the individual, recognizes that he differs in ability and achievement from one subject area to the next as well as from his peers, and does something about these differences.

Cross-Index

To cross-index requires a comparison of elements to identify those which are identical, similar, and dissimilar, a recognition of interfaces, and a knowledge of common levels of skill performance for the integration of objectives across discipline lines.

Course

A course is the learning expectations for a body of behavioral objectives referred to in the traditional program as an algebra class or an English class which qualifies students for Carnegie units of credit.

Interface

An interface forms the area determined by the common boundaries of two bodies, spaces, or phases, the union set between two interrelated subsets.

Interim-Performance Objective

An IPO describes the sequential steps through which the learner should progress to attain each Terminal Performance Objective.

Organic Curriculum

The organic curriculum is a radical modification of the present system designed to permit the maximum self-actualization of each individual student.

System Objectives

The continuous-progress curriculum has as its unifying thread a set of System Objectives which emphasize inquiry and communication skills. These System Objectives provide the broad overall framework of skills which are developed and utilized in two or more subject-area disciplines.

Terminal-Performance Objective

A TPO specifies the end results the learner is expected to attain in each subject area. In many instances these fit directly into the System Objectives and fortify inquiry and communication skills. In some, however, there will be Terminal-Performance Objectives peculiar to the subject-area discipline which do not necessarily relate to the overall System Objectives.

Validity

For the purposes of this study validity confirms the degree of measuring the quality and accuracy of the substance or subject, based on the expert judgments and beliefs of specialists in the related fields.

APPENDIX F

FIGURE C - IMS INFORMATION FLOW

6

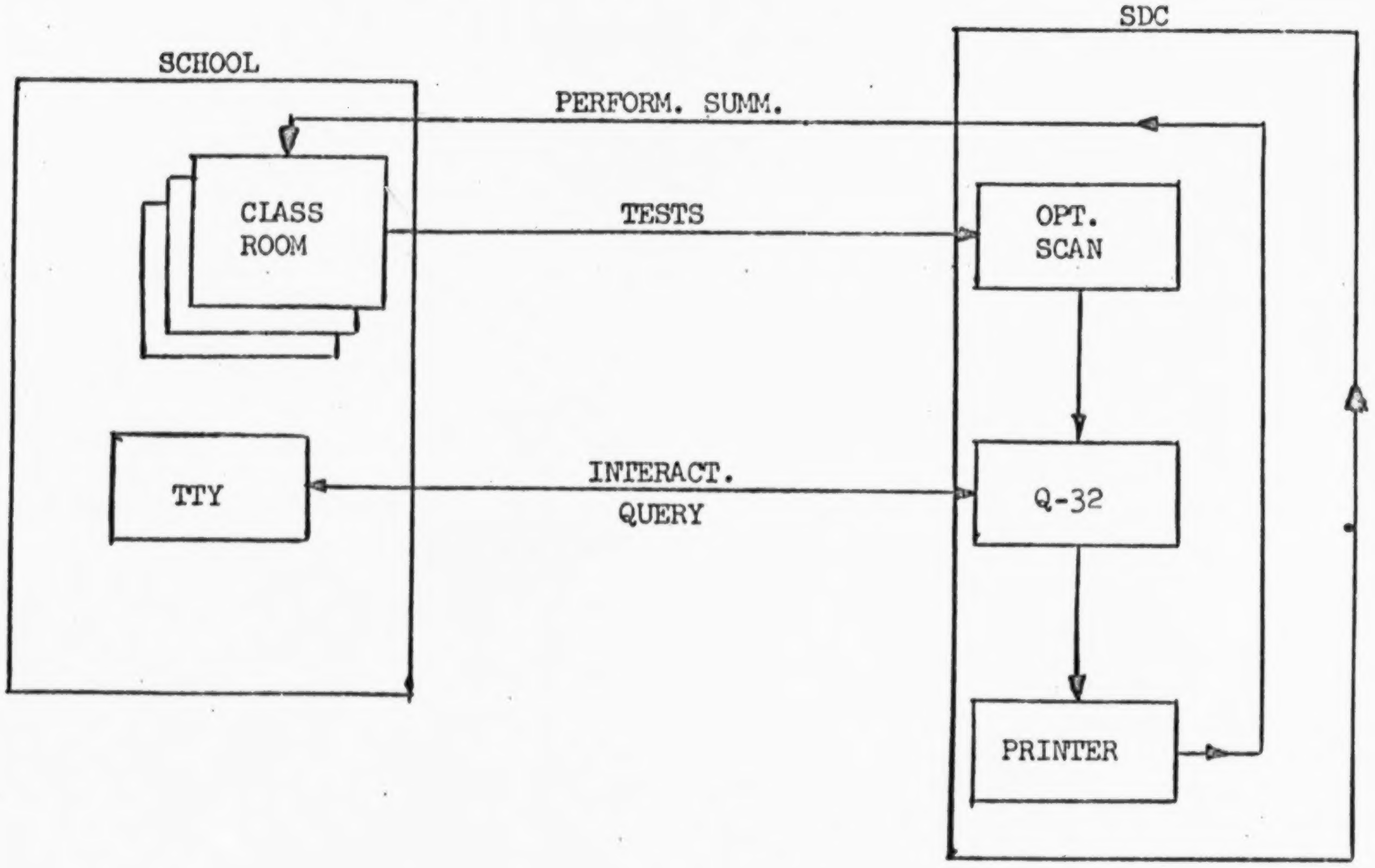


Figure 1. IMS Information Flow (Initial Design).

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